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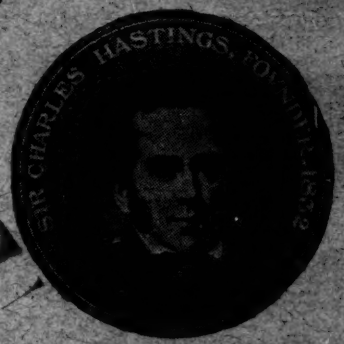

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A Clinical Lecture

ON

THE IMPORTANCE OF GENERAL PRINCIPLES IN MILITARY SURGERY.

DELIVERED AT THE ROYAL VICTORIA INFIRMARY, NEWCASTLE-UPON-TYNE.

BY G. GREY TURNER, MAJOR R.A.M.C.(T.F.),
FIRST NORTHERN GENERAL HOSPITAL.

I HAVE chosen this subject because many of you will before long enter the service of your country as military surgeons, and because the application of principles to practice is a most useful lesson for us all.

The military hospital with which I am associated is situated in a district in which there has always been a big garrison, and much of my work has been concerned with the ordinary surgical ailments arising among any large body of men, and some special troubles connected with the training of the soldier. The latter is a matter which will repay review, and with which I hope to deal at another time. To-day we are only concerned with the wounded returned from Flanders or the Dardanelles—the "overseas cases," as they have come to be known.

To many of us the work of this campaign has been our only experience of military surgery, and at first we were mainly impressed by its novelty. One was led to adopt this attitude by the fact that military surgery is commonly spoken of as apart from everyday surgery. Books are specially written on military surgery; colleges are set apart for its study, and in the old days at our own school there was a professor of military surgery. However, it was not long before I learnt that the principles which underlie surgical practice in general are exactly the same as those which govern the injuries met with as the result of modern firearms. In nearly all the reports from the seat of war the need of guidance by general principles is being recognized.

The peculiarities which undoubtedly exist are due to the nature of the weapons and to the conditions under which the wounds are received, and in which the injured man has to exist for some time afterwards. In other words, it is a question of environment rather than any inherent peculiarity in the wounds themselves.

The Treatment of Wounds in War.

It has been said that antiseptics in war surgery are of no value, and some have gone so far as to infer that antiseptics are therefore useless in general. Many things have been learnt and much excellent work has been done, but nothing that has upset the principles laid down by Lister with regard to the treatment of wounds. It is true that when the men reach the base or a hospital in England the greater proportion of the wounds are infected, but this is largely a question of environment. Owing to the ghastly nature of modern warfare the wounded may have to lie for many hours—men have spoken to me of lying for days—before they can receive any attention whatever, and the range of modern artillery is so great that the attention they then receive is only of the nature of first aid, for it is impossible at the dressing stations to do more; and it may be only after he has reached the clearing station, situated eight or ten miles behind the firing line, that his wounds can have anything like adequate attention. Even in these latter hospitals, after a big action, when large numbers of wounded pass through, it is only very few that can be dealt with as adequately as the principles of wound treatment demand.

Then again the wounds are often inflicted under filthy conditions, for the clothing may have been worn for many days or even weeks, and is nearly always soiled with earth which has been richly manured and highly cultivated for years, and which is found to be teeming with organisms. In these circumstances the possibilities of sepsis are infinite. Further, the nature of the wounds themselves renders proper antiseptic treatment difficult, for they are often irregular, with numerous pockets and side channels, and frequently contain foreign bodies which in their turn carry into the depths parts of the clothing or equipment. I know, as the result of the experience of men from our own school, that when war wounds come under observation before the organisms have actually begun to multiply in the tissues, that is to say, within six or in some cases even twelve hours, then such wounds can be so treated with antiseptics that they do not become grossly infected, and heal much as wounds so treated would heal at home.*

The nature of many of the wounds, especially those produced by shells, makes them exceedingly difficult to cleanse even under the best possible circumstances, and to deal thoroughly with some such would be quite a major operation taking a considerable time. I am afraid that unless the body can be protected against sepsis by some means without local interference, then we must always be unwelcome witnesses to the septic infection of a certain proportion of wounds sustained in warfare. Lister always admitted that the antiseptic treatment of wounds was of more prophylactic than therapeutic value. What is now wanted is some plan to deal with infection when once started, and along these lines much useful work is being done.

Practically all the wounds that have reached us have been septic, and nothing has given me more satisfaction than the way they have healed when treated by the ordinary antiseptic plan as carried out in this hospital. For wounds already infected we largely rely on boracic fomentations, gauze wrung out of 1 in 1,000, mercury perchloride and used moist, or a solution of the same strength made with methylated spirit, and at times irrigation with solutions of hydrogen peroxide, or iodine water. One or two cases have been disappointing, but the great majority have done splendidly so far as wound healing is concerned. In the process of healing there are many stages, and the plan may have to be altered from time to time during the progress of the case, and other adjuncts to recovery must be employed.

Drainage.

All who have had to deal with the wounded are insistent on the importance of drainage, and when one considers the undermining of the tissues, the masses of broken-down material that must be cast off by a suppurative process, and the pockets and side channels which so frequently occur, it is easy to understand the necessity of providing a free outlet for discharges.

The method of drainage is important, and though tubes are undoubtedly the best means, there are abuses and dangers associated with them which we have learnt in the surgery of civil life to avoid. Tubes ought not to be too big. They should be removed the moment they have served their purpose, and it is especially important that they should not be placed in the neighbourhood of blood vessels, for in the presence of sepsis tubes are capable of producing erosion of the latter leading to very serious haemorrhage.

Counter openings are very useful, and cannot always be superseded by the use of tubes.

Quite recently I had to deal with a case in which a subcutaneous laceration had been produced extending down the whole of the length of the outer part of the thigh. The torn muscles were infected and sloughing, and the patient was exceedingly ill. From a point near the trochanter a large tube, nearly a foot long, had been introduced throughout the whole length of the wound, but it was for the most part merely acting as a foreign body. The necessary requirements for the exit of discharges were met by making a series of counter openings through which much shorter tubes were introduced, and thus efficient drainage provided.

This is an extreme instance, but the necessity of providing counter openings should always be borne in mind. I would also draw attention to the importance of position as an aid to drainage, and I was especially impressed by this in the following cases:

A lad had been wounded through the leg and foot. The bullet entered about the middle of the inner aspect of the tibia and found an exit through the middle of the sole, "blowing out" quite a large focus from the bones which had been traversed. In consequence there was a large funnel-shaped wound, with the apex in the tibia and the base in the sole. The condition was grossly infected, and there was a copious discharge of pus. In spite of free drainage, frequent dressings, passive congestion, and the use of sedatives, he was constantly in severe pain as he lay with his foot propped up on a pillow.

* Since this was written, the value of antiseptics in "wounds in war" has been endorsed by Sir Anthony Bowlby in his recent Bradshaw Lecture (see BRITISH MEDICAL JOURNAL, December 25th, 1915).

At this stage the case was seen by my friend, the Rev. Robert Stirling (now a lieutenant in the Royal Army Medical Corps), whose experience of gunshot wounds sustained in the civil life of the Holy Land makes his advice especially valuable at the present time. He suggested that the pillow should be removed and the head end of the bed raised so that the discharge could constantly run out of the wound. The effect was very striking, for pain immediately ceased and recovery was greatly aided.

A similar condition occurred in the humerus in a case in which the wound of exit lay over the head of that bone. This man kept developing secondary abscesses halfway down the arm in spite of a tube introduced right into the medullary cavity. When the foot of the bed was kept raised so that gravity aided the escape of pus, this trouble was got over and recovery was much hastened. In this case a counter-opening about the middle of the arm might have served the same purpose had not the simpler plan succeeded.

Another principle which we have relearnt during the last few years is the importance of fresh air in combating infections. This was well known to our forefathers, and in his delightful account of Alanson of Liverpool my friend, R. W. Murray, shows how that surgeon insisted upon it one hundred and thirty-six years ago. Though employed principally in connexion with tubercle, its usefulness is not limited to the ravages of any particular organism. My septic cases have improved enormously when kept on the balcony or in open tents both day and night, and I believe that no single factor has been of more benefit to patients poisoned with sepsis than the free use of the open air. An illustrative story will suggest to you what happens in these circumstances. Two practitioner friends met in the street. In response to an inquiry Dr. P. said he was sorry to confess that he had a case of puerperal sepsis. Dr. M. inquired how the case was getting on, and was interested to hear that it was progressing favourably towards recovery. Curiosity being stimulated, Dr. M. next asked how the patient was being treated, and was informed that she was having autistreptococcic serum. He remarked on the great expense of the treatment, to which Dr. P. replied that it was costing nothing, for the patient was manufacturing the serum herself!

There is a wealth of meaning in this story, for there can be no doubt that if by fresh air, good food, etc., you can help the patients to make their own antitoxins, they will do it more surely and much more safely than you can possibly do it for them. But it must not be thought that I do not believe in the use of artificially prepared antitoxins, etc. I have to regret three instances of death from septicaemia in both its acute and chronic forms, which I cannot help feeling might have been cured by some form of antitoxin or vaccine had we been sufficiently informed to know exactly what strain was required. Antitoxins and vaccines for the cure of surgical sepsis undoubtedly occupy an important place, but at present it is far behind the other measures which we can employ.

Fig. 1 shows some large sequestra I removed recently from the ilium. The patient was a soldier, aged 39, who was wounded on April 26th, 1915, by a piece of shell which passed through the right half of the pelvis, shattering the ilium and producing a large wound of exit. The wound was almost necessarily septic and there was profuse purulent discharge. Twenty-two weeks after the casualty he was transferred to Newcastle to be nearer his own home. When admitted, on September 27th, he looked much older than his reputed age, and was very lethargic, with a tendency to be discontented. The temperature was irregularly elevated, and the pulse wanting in tension. He took food badly, and generally felt ill and miserable. There was a large sinus over the centre of the ilium, in the position of the exit wound, from which flowed a copious discharge of offensive pus, and at the bottom bare bone could be felt. Here, then, was a man presenting all the signs of a chronic intoxication from sepsis. He had been carefully treated in hospitals in France and at home, but absorption still continued. With careful dressing and feeding he certainly improved a little, but not much; at the end of a fortnight he was much as before, and with a not very hopeful outlook on life. As about six months had elapsed since the infliction of the injury I judged that there would be good formation of new bone, and that the sequestra might safely be removed. The fragments shown were extracted under anaesthesia and the cavity left, which was almost big enough to hold the fist, was packed with gauze soaked in turpentine. The improvement was immediate and remarkable, for his whole temperament appeared to change, and he became bright and cheerful, and has made a splendid recovery.

FIG. 1.—Separated and necrosed fragments from a case of gunshot wound of the pelvis.

I quote this case to show the importance of removing a septic focus. It is a principle in surgery which is apt to be forgotten that all the gross sources of sepsis ought first to be dealt with before falling back on vaccines, etc. It is largely a question of proportion or perspective, and the great thing is to remember first to remove the cause as far as possible, and then to adopt the other measures in the order in which they may be expected to do the most good.

When we come to the question of serum-therapy in prophylaxis we are on very hopeful ground. Last session I spoke on this matter in connexion with the prevention of tetanus,[1] and now I am glad to say that for many months past we have scarcely had a single case, due to the fact that the wounded men are all getting a prophylactic dose of antitetanic serum. The importance of this measure was very well illustrated by the experience of my colleague, Captain Heslop. In one batch of 32 wounded admitted to his wards only one man had not had a dose of antitetanic serum, and he developed acute tetanus on the twelfth day. It proved fatal in thirty-six hours.

Latent Sepsis and the Recrudescence of Sepsis in Healed Wounds.

That septic organisms often lie dormant in war wounds has frequently been illustrated, and has been remarked by most surgeons. One often sees cases of gunshot wounds in which the patient goes on perfectly well for two or three weeks, and then without any demonstrable cause there is an outburst of sepsis. It may take the form of local inflammation only, but there is often cellulitis, lymphangitis, and grave constitutional disturbance due to absorption (sapraemia), or to the presence of the actual organisms in the circulating blood (septicaemia). The condition is not always a relapse, for the manifestation may be much worse than any primary septic trouble, and it is not necessarily due to the introduction of fresh infection because it can occur with healed wounds and without any breach of the surface. I have frequently noticed it after the amputation of fingers shattered by gun fire, and it may occur as the result of massage or the movement of previously infected joints. Sometimes tetanus has been lighted up in this way, though I have not myself seen it. As bearing on this problem, it is well to remember that the organisms of tetanus and gas gangrene have been found in gunshot wounds without either of these diseases resulting. It is, then, reasonable to suppose that they may get locked up in the tissues only to give rise to their specific infections when conditions for their development are more favourable. That organisms or their spores may survive for long periods is proved by the case of a Belgian who was under my care in October, 1914, with multiple shrapnel wounds of the arm. Six weeks after the casualty he developed symptoms suggestive of tetanus, but they were very mild, and I always doubted the diagnosis. Exactly twelve months afterwards he developed typical tetanus and passed through a long illness with dangerous exacerbations. The most serious instance I have come across is the following:

A corporal was admitted to the military hospital on July 30th with numerous small wounds on both legs, the result of a bursting shell. The wounds were not looked upon as serious, and there was only a little irregular pyrexia, the temperature never rising above 100° F., nor was the pulse ever above 80. The wounds soon became healthy granulating sores, and the patient was getting on so satisfactorily that he was up and walking about. On August 27th he went out without his great-coat, staying out of doors for a considerable time. He felt cold and poorly at night, and next day had a rigor. The right leg became swollen and painful, presenting the signs of severe cellulitis with lymphangitis and enlarged groin glands. Symptoms of severe general infection rapidly developed, with a temperature of 103° F., rising to 104°, and on the day of his death—a week after the onset—reaching 106°. *Post-mortem* examination showed evidences of death from general septicaemia without any other cause than the wounds on the legs.

These conditions are certainly very striking, though not peculiar to war surgery, and there must be some general principle involved. Many years ago, when on a voyage from the Gulf of Bothnia, I sustained a scratch over the right elbow in the course of my efforts to help the crew to right a cargo of iron ore in anticipation of the severe weather which followed. I thought nothing of it at the time, but, on arrival at home about a week later, developed severe cellulitis; it was very painful, made me feel quite ill, and had to be incised. In the course of two or three weeks everything seemed all right again, and I had no further trouble until exactly twelve months later, when, without any reason which I could assign, the cellulitis recurred, and was sufficiently bad to require a further incision just by the side of the old one. The following is a brief note of a case occurring in a soldier, which illustrates the same thing:

A man was wounded on April 25th, 1915, a small fragment of shrapnel lodging in the neighbourhood of the knuckle of the ring finger of the left hand. It was only a very slight wound, and, after removal of the fragment, it healed in three days. He thought nothing of it, although occasionally the place ached a little.

Some time after this a high-explosive shell burst close to him, and he was invalided home with shell concussion. August and September were spent in the country, and on September 25th, when in splendid general health, the injured finger suddenly swelled up and became very painful, while the pain went up his arm and the glands in the axilla became enlarged. There was a little local infection, a small abscess bursting and discharging. There was no sign of any foreign body. After a few days the whole thing cleared up, and he was all right again.

The Reopening of Healed Wounds.

Another trouble which is sometimes spoken of as if peculiar to war wounds is the breaking down of a scar apparently completely consolidated, but in these cases there is often a definite and tangible cause.

A soldier was wounded on May 16th as the result of the bursting of a hand grenade. He sustained a shattered fracture of the lower end of the ulna, and some portions of shrapnel were removed. On May 25th he was admitted to the 1st Northern General Hospital with a healthy granulating wound which was apparently soundly healed at the end of a month. He was sent to a convalescent home, but he had not been there long before the wound broke down and discharged. It again healed and was apparently all right when the same trouble recurred and delayed his return to duty. At the end of eight weeks the wound was apparently perfectly sound, and after inspection by an experienced surgeon he was marked for sick furlough and return to duty, but on the day on which he was to leave the home the wound again commenced to discharge, and he was readmitted to the 1st Northern General Hospital. An *x*-ray photograph showed there was still some necrosis, and under an anaesthetic I found a small cavity which contained the sequestra shown in Fig. 2. After their removal the wound healed from the bottom and gave us no further concern.

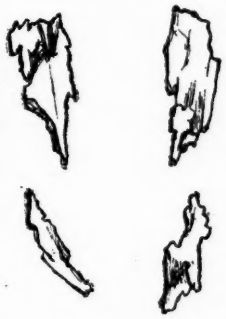

FIG. 2.—Sequestra from the ulna, the cause of the reopening of a healed wound.

Another similar case was due to a metallic foreign body:

A young private was wounded in May by the bursting of a hand grenade. The right knee, left leg, and left foot were each injured, and in France portions of casing were removed from all the wounds. They all healed soundly except that on the foot, which healed and broke down many times. After being in hospital four months, he was discharged with the wound healed, but ten days later it again reopened, and he was admitted to the 1st Northern General Hospital. He then presented a scar on the outer part of the dorsum of the left foot, with a small unhealed area at one en No foreign body could be felt, but *x*-ray examination showed a metallic fragment imbedded in the os calcis. At the operation for its removal the foreign body was found imbedded in granulation tissue which was directly connected with the under surface of the scar.

Sinuses.

It is an established principle that a sinus is to be looked upon as a symptom and not a disease, and before any consideration of treatment it is necessary to diagnose its cause. It is common to see men wounded at the war who for some considerable time afterwards, when in perfect general health, present a sinus, discharging more or less pus, and a local rather than a general inconvenience.

Sometimes a gross foreign body, such as a portion of projectile, is still *in situ*, but these are the simple cases not likely to be missed.

An example is that of a man who was wounded at the battle of the Aisne on September 13th, 1914. The bullet entered the upper part of the right thigh just above the trochanter. He was treated at various hospitals, and was finally given sick furlough for a month. During all this time the wound never completely healed, and on December 9th he was admitted to the 1st Northern General Hospital with a small sinus just above the trochanter on the right side. The *x*-ray photograph demonstrated a shrapnel bullet, and under an anaesthetic this could be easily felt, and was removed together with a portion of garment. The sinus promptly healed, and the patient was soon able to be discharged cured.

I have recently had the following case under my care:

A man of 22 was wounded in the right thigh by the bursting of a bomb on July 16th, 1915. A piece of casing was removed from the back of the thigh by a separate incision on July 24th. The wound made for the latter purpose healed almost at once, but the original wound continued to discharge, and he was admitted to the 1st Northern General Hospital on July 30th. The original wound was quite small, and was represented by a sinus which passed right across the thigh to the inner side. Nothing could be felt with the probe, and *x*-ray examination was entirely negative. The patient himself was perfectly well, but every now and then there was a considerable discharge of pus from his wound, which never completely healed. Rest with irrigations and suitable dressings certainly caused a diminution of the discharge but did nothing to obliterate the track, and on September 18th, under an anaesthetic, I explored, and after enlarging the external aperture removed a piece of clothing about an inch square, evidently a portion of the man's trouser. After this the sinus rapidly closed, and he had no further trouble.

Another frequent cause is the formation of a sequestrum; the number of sinuses due to this is very remarkable. In military surgery a very considerable injury to the deeper tissues may result with a very small wound of the superficial parts. Fig. 3 is drawn from an *x*-ray photograph of the femur, and Fig. 4 shows the sequestra subsequently removed, in the case of a man whose thigh was traversed by a bullet from front to back. The casualty happened on May 15th, and he came under my care on June 20th with a sinus leading down to the femur. On September 26th the sequestra (Fig. 4) were removed, after which the sinus began to heal.

FIG. 3.—Showing comminution and necrosis of the femur, the result of a bullet wound.

FIG. 4.—Sequestra removed from the same case as the preceding figure.

Secondary Haemorrhage.

In connexion with this subject well-established surgical principles are constantly being exemplified, and it is interesting to know that these principles were first formulated as the result of the experiences of a great military surgeon—George James Guthrie—who gained his knowledge in the Peninsular wars, chiefly between 1808 and 1815, when he operated on many of the wounded from Waterloo. His *Commentaries on Surgery* will well repay

study at the present time. Guthrie showed conclusively that in cases of secondary haemorrhage the bleeding very often came from the distal end of the injured artery, and that it is therefore necessary to expose the artery at the site of the wound, and to tie both ends rather than adopt the plan of the proximal ligature which was the favourite method up to his time.

A very striking illustration of this principle was furnished by the following case:

A man was wounded by a bursting shell which ploughed up the tissues over Scarpa's triangle. The femoral had to be tied just below Poupart's ligament, and the patient was admitted under my care some days afterwards with gangrene of the leg and a deplorably septic wound all over the front of the thigh. I had scarcely left the hospital after seeing the case when I was hurried back on account of alarming haemorrhage. The patient was exceedingly ill, and had lost so much blood that I thought the ligature applied to the cut end of the femoral artery must have given way. As a matter of fact the bleeding was from the end of the profunda femoris, which was lying exposed in the wound, the parent trunk having sloughed away. This, then, was an excellent instance of secondary haemorrhage from the distal end, or rather a distal branch of a severed artery. Had the ordinary principles been neglected, and the external iliac artery ligatured, the haemorrhage would probably not have been arrested, or would have recurred owing to the freedom of the collateral circulation. Though the patient was exceedingly ill he rallied sufficiently to allow me to amputate the thigh a day or two later, and ultimately made a complete recovery.

On the Removal of Foreign Bodies and the Use of the Roentgen Rays.

You cannot see much of military surgery without being confronted with the problems connected with the removal of foreign bodies, nor will you be long without appreciating the enormous value of the *x* rays. Let me state very clearly the conclusions at which I have arrived as to the removal of foreign bodies from patients arriving at a base hospital at home.

I think that in the great majority of cases it is a wise thing to remove a foreign body if this can be done without running any grave risk so far as the life of the patient or the function of the affected part are concerned. We are constantly getting patients admitted to hospital whose wounds are healed and who have returned to duty, but who do not feel happy in their minds because of the knowledge of the presence of some extraneous foreign body in their anatomy. I find that it makes all the difference in the world to a man whether his foreign body is in his chest wall or his waistcoat pocket. It is, after all, a psychological matter in many cases, and if such a gross mechanical performance as a surgical operation can lift a permanent load from the patient's mind, then strong reasons are required before you should desist from your efforts. Certain principles must always be kept in mind. First, you must clearly recognize that if you cannot do good you have no business to run the risk of doing serious harm. Secondly, no one should undertake the removal of a foreign body without very careful consideration as to its exact position and relation to surrounding structures. An operation for its removal should never be carried out without an *x*-ray examination, because so often there are multiple foreign bodies or there are concomitant injuries to bones which can be dealt with at the same time. No attempt should be made to remove foreign bodies without careful localization unless they can be certainly felt near the surface. As the foreign body is always potentially a source of infection, the area from which it has been removed should always be drained.

I would also plead for the routine use of the *x* rays even in cases in which the foreign body can be felt, or in which the lesion, whatever it may be, is apparently perfectly obvious. It is wonderful how many revelations one gets, and often in cases in which the injuries have been apparently trivial. Let me tell you of the case represented in the diagram (Fig. 5) which I have made from an *x*-ray photograph.

This man was injured by shrapnel in the lower part of the right thigh. There was a small sinus on the outer side leading to a piece of metal, apparently quite close to the surface. A skiagram of the immediate vicinity only showed a foreign body lying just inside the cancellous tissue of the bone. The problem seemed very simple, and it looked as though the case was almost a trivial one, but on examination I discovered a large hard swelling in the upper part of the inner aspect of the thigh. It was smooth, hard, and scarcely tender, but there was a little increased heat. Had there been no question of injury it would certainly at first give rise to the suspicion of a sarcoma, or it might have been an enormous gumma. However, an *x*-ray picture of the whole femur showed a crack extending from the point at which the foreign body was impacted half way up the shaft and then across the inner aspect of the bone, the mass being represented by a large amount of callus thrown out about the latter, and probably due to the fact that the patient had not had adequate rest, no serious injury to the bone being anticipated.

Instances of this kind are very common. I would only mention one.

An officer accidentally shot himself with his revolver. The bullet entered over the front of the tibia, 4 in. above the ankle-joint, and a very tender point just in front of the ankle-joint, and apparently not far under the skin, suggested the position of the missile; *x*-ray examination showed that the bullet had really traversed the tibia from just below the wound of entrance to its lower end, producing an amount of injury which would never have been suspected either from the symptoms or from any physical signs.

FIG 5.—A diagram made from an *x*-ray photograph. A fragment of shrapnel was lodged at the point A, and there was a large mass of callus at B. The longitudinal fissure was only disclosed on *x*-ray examination, the injury having originally been looked upon as trivial.

With regard to the actual removal of missiles I think we have retrogressed a little. In the old days when Nélaton's probe was invented the efforts of the surgeon were almost entirely limited to the removal of foreign bodies by way of the wound of entrance, and this is a method which is still sometimes exceedingly useful. If a foreign body can be easily felt with the probe, and if an *x*-ray examination confirms the position and the fact that it is single, then to remove it through the original track is often a simple matter, and I have several times been successful, especially with the round shrapnel bullets which were so frequent in the early days of the war. It is, of course, sometimes necessary to enlarge the wound of entrance and the aperture in the deep fascia, but nowadays we have the aid of anaesthesia which our forefathers lacked, and this greatly increases the scope of the measures with which they had to be content. If the wound of entrance and the track have healed, then it is often expedient to remove the foreign body by some shorter route, cutting on to it directly.

With deeply situated foreign bodies, and foreign bodies in inaccessible parts you cannot have too much information, and I would urge you never to attempt the removal of foreign bodies without an *x*-ray plate or plates as a guide. Very frequently the radiographer marks the site of the foreign body exactly, and gives an indication of its depth, but without the plate some important point may be missed which may have a great bearing on the success of the operation.

In a case in which a rifle bullet was embedded in a rib, the wound of entrance was on the surface of the back, and close to the point at which the bullet was seen to be lying by the screen. It was accurately localized, and I foolishly attempted to remove it without having seen a plate. To my great disappointment I failed to find the bullet, but at a second operation the knowledge that it was actually embedded in the rib made its removal quite easy.

In our *x*-ray department some simple devices have been found most useful. For instance, it has been observed that when a foreign body is near the surface it can easily be made to move by pressing over its site during a screen examination. We have also found a screwdriver used as a pointer very useful, and wires have been found of value in the localization of bullets in the chest and in the head.

Always beware of making ill-considered attempts to remove small foreign bodies embedded in muscular parts, and indeed they are of minor importance, because they are scarcely likely to give rise to much trouble in such situations.

At the beginning of the war and for some time afterwards foreign bodies in the chest were supposed to be in sacred ground, and patients were universally advised to have them left alone. Being impressed with the amount

of mental anguish which some of these men appeared to endure because of the knowledge that they had a foreign body in their lungs, I have now on four occasions deliberately opened the chest and removed bullets or shell casing, and in each case with complete recovery.

The Need of Ordinary Methods of Examination.

Nowadays, with so many special methods of examination at our disposal, we are all apt to forget the routine plans which have stood us in such good stead for so many years. I have indicated the extreme value I attach to *x* rays, but they should not be used to the exclusion of other and simpler methods of examination. These points were well illustrated in the following cases:

A man who had been wounded in the left side of the back complained of persistent pain on defaecation. There was no wound of exit, and a fruitless search had been made for the foreign body, the whole of the left side of the back and pelvis and all down the left thigh being *x*-rayed. When he came under my observation, in the course of routine examination I palpated the rectum, and found what I took to be the foreign body lying on the right side and within easy reach of the finger. The presence of a shrapnel bullet in this situation was confirmed by the *x* rays, and it was subsequently removed by an incision to the side of the coccyx, with complete relief to the symptoms.

In another case a rifle bullet which entered above the right hip was followed by some paresis of the limbs with retention of urine and incontinence of faeces. It was thought that the bullet had lodged somewhere in the spinal canal, but on careful examination with the screen it was disclosed on the outer side of the left thigh in a position in which it could easily be felt had we examined him systematically with a knowledge of the vagaries of bullet injuries in our minds.

In a similar case the bullet had entered in the middle of the left buttock, and could easily be felt lying just under the skin in the middle of the front of the right thigh.

In traversing wounds of the limbs it is remarkable how blood vessels and nerves can be missed, but it is most important never to assume that these structures have escaped, and to be constantly on the look-out for evidence of injury of nerve or blood vessel.

In civil practice it is unfortunately quite common to see paralysis of important nerves after wounds of the limbs have been dealt with and have healed satisfactorily, and it is well always to make it a rule to examine all the nerves that might possibly be injured. A dropped wrist or foot are usually very obvious, but a lesion of some other nerve with less characteristic symptoms may be overlooked. The same thing applies to the blood vessels, and in the case of a man who was wounded through the calf as well as in the head and knee it was only many weeks after the injury that a systematic examination disclosed a slight swelling of the limb together with a widespread purring hum, which was the only evidence of an arterio-venous aneurysm involving both the posterior tibial and peroneal arteries.

In dealing with possible blood vessel injuries it is also very necessary to re-examine the patients from time to time.

In one case a traumatic aneurysm gave no evidence of its presence until twenty-six days after the casualty. In another a man who was peppered with shrapnel on May 15th was sent to a convalescent home on June 12th, apparently making an excellent recovery from what was considered to be a trivial injury; on June 25th he suddenly developed a large pulsating swelling behind the knee, which proved to be a traumatic aneurysm of the popliteal artery.

The same need of careful examination is exemplified by injuries to the chest. These are commonly thought to be beyond the scope of surgery, and to merit very little attention, but they are all worthy of very careful examination from time to time, and for long intervals afterwards. This is well illustrated by the following case:

The man was shot on May 8th, 1915. The bullet entered in the centre of the sternum, just below the manubrium, but there was no wound of exit. He suffered from shortness of breath and pain in the chest, and for a time had a high temperature. These symptoms gradually improved, and in three weeks he was sent to England. On June 24th he was allowed to go home on sick furlough, and at the expiration of this time rejoined and started work at recruiting. He managed fairly well for a week, and then had to give up on account of shortness of breath. When admitted to the 1st Northern General Hospital careful examination showed very definite signs of an empyema at the left base, from which I removed the bullet; complete recovery followed.

In ordinary surgical practice the best diagnoses are made when time is taken to go carefully into the history, and the same rule applies to military surgery. This was borne out by the following case:

A man was admitted to the hospital because he was supposed to have a bullet in his lung. He had certainly been shot from behind, and had spat blood, but on going carefully into his history he volunteered the information that immediately after the injury he saw the end of the bullet sticking out of the front of the chest like a nipple, though the swelling which followed almost at once pushed the skin away, thus obscuring the protruding missile. In this case the bullet was found lying on an intercostal space just in the position described by the man, and from which it was removed with the greatest ease.

Gunshot Fractures.

In fractures due to injuries by firearms some special points ought always to be borne in mind. The injury to the bone very often bears no sort of relation to the size of the superficial wound, the extent of damage to the underlying muscles, or to the shock of the casualty. For instance, an injury due to a bullet may present only tiny wounds of entrance and exit, and yet the bone may be extensively comminuted; whereas in certain types of shell wounds all the soft tissues may be torn away, leaving the bones bare but uninjured.

Cracks and fissures* are exceedingly common and are frequently very extensive, the whole of the shaft being sometimes involved. With such injuries there may be no deformity, abnormal mobility, or want of alignment, and men may even walk or use the affected limb, and it may not be until there is an excessive amount of unexpected callus that the fracture becomes evident. These considerations make routine *x*-ray examination essential in estimating the amount of damage sustained by the bone. Such examinations are worthless, or nearly worthless, unless photographs are made in two planes.

Extensive comminution is the most characteristic feature of gunshot injuries of bone and may exist both with and without separation of the fragments. A bullet may pass through a bone making a regular trephine opening with or without complete fracture or comminution; or the foreign body may be lodged in the bone or in the neighbouring soft parts. When fragments are driven into the soft tissues they may produce very extensive wounds at the point of exit, and it is these cases which commonly give rise to the stories about the use of "dum-dum" bullets. Sometimes quite a mass of bone may be shot clean away, leaving a gap in the shaft. Splaying out of bone fragments about the track of the bullet is another common feature. The only safe rule is to suspect every case and to make routine use of the *x* rays. In the leg and forearm it is fortunately common to get a gunshot fracture of one bone only so that the other acts as a very good support.

FIG. 6.—A gunshot fracture in which the comminuted fragments were removed. There was no sign of regeneration six months after the casualty. The gap was subsequently bridged by a bone graft.

The surgeon must always be on the look-out for concomitant injuries to vessels and especially nerves.

So far as the wounds are concerned, the same principles ought to guide us as in the treatment of compound fractures sustained in civil life. A most important point is to resist the temptation to remove loose fragments (Fig. 6), for there is abundant evidence in surgery to show that bone is the best stimulus to the formation of bone. It is impossible to say how much bone will live or die; that question can only be settled by Nature, and in almost every instance she spares more than one would expect (Figs. 3 and 4).

There is a great temptation to use plates and screws,

* A *crack* is a cleft whose sides are very near together and can hardly be seen; a *fissure* is a visible cleft whose sides are widely separated.—DELORME.

but for my own part I have not yet made up my mind that this is good practice in compound fractures; and it will take a good deal of evidence to show that internal splinting is to be accepted as a principle in the treatment of gunshot injuries.

FIG. 7.—A gunshot fracture of the radius which had been allowed to unite with the hand in the prone position.

[In speaking of disabilities which might result, Major Grey Turner instanced the following cases:

A man was shot through both bones of the forearm; the fragments united in such a way that he was unable fully to supinate the hand, doubtless because more attention was paid to the wounds than to the position of the bones.

A man had a similar fracture at the junction of about the middle with the lower third of the radius (Fig. 7). In that case the same disability existed, but in an exaggerated degree.]

The important thing is to deal with the fracture so that the bones of the forearm are kept fully supinated. In this way the patient will acquire the best functional result, and on this the ultimate usefulness of the limb will depend. It does not much matter how the arm is put up to secure this full supination. It is not a question of some special splint or piece of apparatus but of a principle which must be borne in mind. Personally, I prefer to use two straight splints made of gooching and extending from just below the shoulder to the extremity of the metacarpus. The fixation of the splint to the upper arm secures complete supination of the forearm.

The same thing applies in the case of those fractures at the lower end of the femur in which there is backward displacement, as in the supracondyloid fracture of civil life. The displacement must be met by flexion of the knee; neglect of this precaution, though it may not interfere with union, often gives rise to a very crippling amount of disability in the movement of the joint. Similarly, gunshot fractures of the upper end of the femur ought to be treated with the limb abducted if the best results are to be obtained.

In most cases the principle of extension must be employed, and this more so than in civil life, because so often there is great shattering of the bone or actual loss of substance. To carry this out in the lower limb often causes much trouble, and a great deal of ingenuity has been exercised in the manufacture of apparatus for this purpose. In the upper limb the problem is simpler, and for fractures the weight of the limb can usually be relied upon to secure the necessary amount of extension, and with excellent results. Most of my cases of gunshot fracture of the humerus are treated by suspending the wrist in a short sling, sometimes with the addition of pieces of gooching applied over the seat of fracture and fixed to the chest with a circular bandage.

Bones require rest and time for their repair, and this is especially important in military surgery, where the presence of sepsis so often delays union. Aching and tenderness at the site of the fracture are sure signs that repair is not yet complete and equally certain guides to the necessity of further rest.

Injuries to Joints.

The surprising way in which many of these injuries recover with a good range of movement has frequently been a matter for comment, but nevertheless all cases do not end so favourably. Since it is usually impossible to tell at an early stage of the case whether or not ankylosis will occur, it is very important to deal with these cases in such a way that should such an untoward result follow the limb will be in a useful position. This rule should always be followed whatever the cause of the joint injury, but it is especially exemplified by numbers of cases met with in military practice.

[Major Grey Turner instanced the case of a man who sustained a bullet wound through the elbow-joint, followed by severe sepsis; the arm was treated at a right angle, and, as ankylosis followed, the usefulness of the limb was much interfered with.]

Injuries of the elbow-joint should be treated in a position midway between a right angle and full flexion, for this is certainly the most useful should ankylosis occur. It is then easy to reach the mouth, to brush the hair, to get at the coat pockets, and so on. Such a condition may subsequently be treated by arthroplasty, but it may be that the patient will not submit to any interference or there may be some other reason why it should not be carried out, and therefore it is imperative to treat these joints in the most useful position at the outset. This applies equally to the wrist, for should it become ankylosed neither excision nor arthroplasty gives any certainty of a good result. Cases with shattered joints, such as that shown in Fig. 8, should be put up in the dorsiflexed position, for then the grasp is strong and the hand very useful. If ankylosis takes place with the wrist slightly flexed, as so often occurs, the grasp is very weak indeed. It is easy to test this matter for yourselves, and you will be surprised at the difference the position makes to the usefulness of the hand. If the shoulder is the joint affected the arm should be kept fully abducted, for this materially increases the range of movement obtained through the scapula, and also prevents the annoyance of the arm constantly rubbing against the side.

FIG. 8.—Shattering of the carpus and adjoining parts the result of a gunshot wound. A case to be treated in the dorsiflexed position.

The hip should be slightly flexed and abducted. When the knee is the joint affected it should be kept just a little flexed, while in cases of great destruction of that joint it is most important to prevent the outward and backward displacement which is so apt to occur. When the ankle is involved the foot should be slightly pointed, for this much diminishes the loss of elasticity which a fixed ankle-joint entails.

What has been said about the length of time necessary for recovery in fractures and about the significance of persistent tenderness especially applies in cases of joint injury. My experience has taught me that "more rest and less massage" is a very sound axiom in dealing with joints that have one time been infected. If John Hilton, the gifted author of *Rest and Pain*, could but revisit this globe, he would be delighted to find that the principles he so wisely upheld have stood the test of time.

Injuries to Nerves.

There is great need of care in the treatment of paralysed parts, especially to keep the muscles, whose nerve supply is cut off, in a state of relaxation, so that the recovering nerve will not find them so overstretched that much valuable time is wasted in "taking up the slack." This is best illustrated by a reference to musculo-spiral paralysis, where the dropped hand means harmful stretching of the extensor tendons, easily provided against by the wearing of a simple straight forearm splint during recovery.

The Psychological Factor in War Surgery.

The influence of mind over body is an important factor which is well recognized by all who have to deal with the sick, and it is especially so in our military work. Here we are dealing with men who are frequently a very long way from home and friends; who have suffered the fatigue of war and have often for the first time been introduced to many of the horrors that follow in its wake. These men are not normal in mind—there is often a temporary loss of balance, and it is a wonderful commentary on the amount of backbone possessed by our nation that the wounded are so constantly cheerful and bright in spite of their great trials. But it is most important to recognize this aspect of the matter, and it says much for the wisdom of the authorities that so far as possible they arrange for wounded men to be sent home to England as soon as they are fit to

travel. To be once again in their home-country and within reach of friends does much to help recovery in bad cases. Similarly, the bright surroundings of our hospitals are valuable therapeutic agents, and they ought to be aided by a cheery optimism which I think it will not be difficult for any of you to cultivate. Always remember that one of the most valuable and cheapest remedies we possess is hope.

REFERENCE.
[1] *Durham University College of Medicine Gazette*, December, 1914.

FURTHER NOTES ON PROTOZOAN INFECTIONS OCCURRING AT THE KING GEORGE HOSPITAL.

BY
H. M. WOODCOCK, D.Sc., AND W. J. PENFOLD, M.B., D.P.H.
(From the Bacteriological Department, the King George Hospital, Waterloo, S.E.)

DURING the last six months the fæces of altogether 384 different cases have been examined for protozoan parasites. The findings obtained are set out in the following table, from which it will be seen that 98 cases have shown one, sometimes more than one, of the protozoa tabulated; the proportion of positives is 25.5 per cent. of the whole. *Blastocystis* has been omitted; if this form had also been included, the total would have been considerably greater. We have omitted it, however, not because we do not consider it a protozoan, but because it occurs so generally that we have ceased to record it in the ledgers; in nearly all the stools, although no other parasite may be present, a few *Blastocystis* individuals can be found if particularly looked for. Certainly as a general rule this organism does not appear to have the slightest pathogenic effects. The only case in which it was apparently the cause of diarrhœa has been that referred to in a previous note;[1] from this patient no other pathogenic organism was recovered.

Table of Cases Examined, showing those Infected with Protozoa. (Total Cases, 384.)

	No. of Cases.	Percentage of Total.	Percentage of Positives.
Infected with Protozoa ...	98	25.5	
FLAGELLATES:			
Lamblia	22	5.7	22.4
Trichomonas	14	3.6	14.2
Macrostoma	11	2.8	11.2
ENTAMOEBAE:			
E. coli...	57	14.8	58.1
E. histolytica... ...	8*	2.0	8.2
COCCIDIA:			
Isospora	10	2.6	10.2

* This is inclusive of one case of liver abscess, in which the parasites were recovered only from the wall of the abscess.

Nearly all the cases have been examined, of course, two or three times, often more. With rare exceptions, the first examination has revealed the presence of the particular parasite (or parasites) occurring; in one or two cases of a very scanty *E. coli* infection the cysts have been noticed first at the second time of examination. Practically all the infections have occurred in men who had been at Alexandria (or elsewhere in Egypt) and Gallipoli; a *Lamblia* infection was found, however, in a patient who had been only on the French front; this man had in all probability contracted the infection from association either with French colonial troops or with Indian regiments. A case of relapse of amœbic dysentery, after a long interval, occurring in France is noted below. As has been pointed out recently by Ledingham and Penfold,[2] we have not obtained any definite indication of a relation between the occurrence of bacillary dysentery or typhoidal disease and the presence of a protozoan infection in the intestine.

From the table it will be seen that *E. coli* has proved the commonest of the parasites enumerated, occurring in 14.8 per cent. of the total number of cases and in more than half of the total positives. *Lamblia* has been the next most frequent, but this form has been found in only 5.7 per cent. of the total number of cases. The other flagellates have been less frequent. The view taken by one of us in a preceding note with regard to the coccidian found, in which it was considered to be probably an *Isospora*, has been fully confirmed by Wenyon.[3] The coccidian of the genus *Coccidium* itself, which has since been found by Wenyon,[4] has not been seen in any of our cases. (It may be pointed out that *Coccidium* differs from *Isospora* in forming 4 spores in the cyst (oocyst), instead of 2, as in *Isospora*; but, on the other hand, the former genus has only 2 sporozoites (germs) in each spore (or sporocyst), instead of 4, as in the latter.) In all the 10 cases in which *Isospora* has occurred the number of the parasites in the faeces has been scanty, and there has been no sign of pathogenicity in connexion with their presence.

AMOEBIC DYSENTERY (AND LIVER ABSCESS).

The *Entamoeba* of amœbic dysentery and liver abscess, generally regarded as *E. histolytica*, has been found, in one form or another, in 8 cases, all of these occurring since our first note was published. Certain of these cases are worthy of brief mention.

Convalescent Amoebic Dysentery.

Case 1.—The patient gave no agglutination reaction to Shiga's bacillus. On two occasions, in loose brown stools (after a saline purge), scanty, active *histolytica* forms, of typical character and with one or two containing red blood cells, were found. No cysts were seen and later examinations were entirely negative, both as regards active forms and cysts. This patient had received daily emetine injections for a week prior to the first observation of the amœbae.

Liver Abscess.

Case 2.—The patient had chronic diarrhœa and the stools were usually thin and clayey-yellow in colour. In the first stool examined numerous *Trichomonas* were present; these parasites were also found subsequently, but only once, for some reason or other, although the stools were well examined several times. On no occasion were *Entamoebae* found, whether *histolytica* or *coli*, either active or encysted. Nevertheless, from the wall of the abscess typical active forms of *histolytica* were obtained. It may be pointed out that the blood count of this patient showed no leucocytosis.

In the remaining cases cysts only have been found (up to the present).

No History of Dysentery.

Cases 4 and 8.—These cases are instructive because no history of true dysentery can be elicited. In Case 4 the patient gives a history of diarrhœa (four or five stools a day) for about a week while in Alexandria, at the beginning of September; but no blood or mucus was noticed. He did not report sick at the time, and is positive he had no emetine injections, then or later. He was sent to Gallipoli, whence he was almost immediately invalided as suffering from enteric. Dr. J. D. Thomson, of the bacteriological department here, informs us that this patient gives no agglutination reaction either to typhoid, paratyphoid, or bacillary dysentery.

Case 8 also gives no history of blood and mucus, or even of marked diarrhœa. During August, while at Suvla Bay, he remembers occasionally having four or five stools a day; he never had any treatment. The patient subsequently developed jaundice, and later nephritis, on account of which he was sent home.

Both these cases were found on examination to be passing large numbers of *tetragena* (*histolytica*) cysts and no *E. coli* cysts.

Relapses of Old Amoebic Dysentery.

Case 6.—This patient had been in India for several years, during which period he had three attacks of dysentery (presumably amœbic). The last occurred at the end of 1909, just before his return to England; the patient states that he had on this occasion four injections (? of emetine). Last October, on the French front, he had dysentery, with blood and mucus for twelve days. He was invalided to a base, where he received one injection of emetine. His condition improved, but diarrhœa continued intermittently, and he was sent home to a provincial convalescent hospital. While on leave in London he had a return of blood and slime on one occasion and reported sick at this hospital.

In this case, we have to deal, in all probability, with relapses of the old amœbic dysentery, after an interval of six years. This patient's serum also gives no indication of typhoidal disease or bacillary dysentery.

The incidence of the cases of amœbic dysentery in this hospital up to the present has been most interesting in relation to the occurrence of cases of bacillary dysentery, and well illustrates the liability to error of random sampling on a small scale when attempting to obtain any idea of the general numerical ratio between the two types. Up to the middle of last December the first two cases referred to above were the only cases showing *E. histolytica* in any form which came into the hospital, while

during the same period, out of a sample of 103 cases examined by agglutination, 47.5 per cent. were found to be *B. dysenteriae* (Shiga) infections. Unfortunately we had no means of knowing whether any of the cases received into the hospital whose stools were negative in respect of cysts had had amoebic dysentery and completely lost the parasites—that is, had not become cyst carriers. In this connexion we can only point out that certainly four of our cases received emetine injections, two of them eight or nine doses, and were nevertheless not freed from the parasites and those who were not treated at all are very heavy cyst carriers, although two of them do not appear to have had well-marked dysentery.

The six cases of cyst carriers have all entered the hospital since the middle of December, most of them within a very short period of each other. Dr. Thomson has kindly done the agglutination tests of these six cases against the chief members of the dysenteric and typhoidal groups. He finds that in only one case (that described more fully below) is there a probable indication of an infection with *B. dysenteriae* (Shiga). The patient's serum agglutinated ++ at 1 in 50, definite trace at 1 in 100. In another case of amoebic dysentery, however, which was specially transferred on our account to this hospital, just before we had the above succession of cyst carriers, and which is not included in our own list, there is clear evidence of an infection with Shiga in addition to amoebic dysentery, this patient's serum agglutinating +++ at 1 in 50, ++ at 1 in 100, trace at 1 in 200. It is worth noting therefore that out of 59 known cases of either amoebic or bacillary dysentery, only in one or, at most, two cases can we say definitely that both types have occurred together.

Occurrence of Entamoeba "minuta."

In one of our cases of cyst carriers the cysts have been markedly different from the usual type of *E. histolytica* (*tetragena*) cyst. The patient had been in India for seven years, but states that he never had dysentery or malaria while there. He gives a history of dysentery occurring

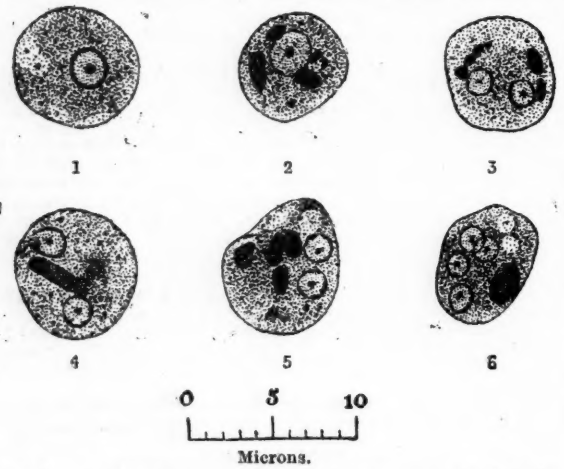

FIG. A.—*Entamoeba minuta* (from stained preparations). 1, Form preparatory to encystment. 2-6, Cysts with varying number of nuclei.

last September, while at Gallipoli. He had diarrhoea for two days, then blood and mucus for four days, the diarrhoea continuing subsequently for nearly a month. He received eight injections of emetine, one daily. He considered this did good. On two successive examinations of the stools, towards the end of last December, the cysts mentioned were found. The patient then had four injections of emetine, after which no cysts were again found until January 19th, when a few were present in the stool.

The most striking character about the cysts is their uniformly small size. They are generally spherical, from $7\frac{1}{2}$ to 8μ in diameter, but occasionally are slightly ovoid, about 7 by 8μ; we have never seen any cysts larger than 8μ at any examination of the stools. The cysts have a greenish, rather refractile appearance, and in the fresh condition no definite internal structure or nuclei can be made out. The cyst membrane is thin and does not show a double contour. After adding iodine solution one or two nuclei can usually be seen, and the chromidial blocks or masses, when present, generally take up the stain also, but these masses do not stand out so conspicuously in these cysts as do the chromidial bars in typical *histolytica* cysts. In permanent preparations stained with iron-haematoxylin the cysts show nearly always one (Fig. A, 2) or two nuclei (Fig. A, 3–5); only in a single instance (Fig. A, 6) have we found a cyst with four nuclei, although the preparations have been well searched. (In the figures the chromidial blocks or masses are stained up intensely.) Fig. A, 1, shows an early stage in the encystment of this form. In addition to its smaller size, the nuclear character differs apparently from that of the nucleus of the cyst-producing, "*tetragena*" phase of *E. histolytica* in not showing a ring-like karyosome with a contained centriole-like body.

James, in a recently published excellent account of the *Entamoebae* of the Panama Canal zone,[5] describes the occurrence of what is undoubtedly the same form, and his figures closely resemble ours. James thinks that this *Entamoeba* represents the *E. minuta* originally described by Elmassian. We do not feel at all certain as to this, because the dimensions given by Elmassian for the cysts agree with the usual size of *tetragena* cysts, and are distinctly larger than those found either by James or ourselves; but we retain, provisionally, the same *minuta*. James is inclined to consider this form as associated with a mild type of amoebic dysentery, and concludes that if *E. minuta* is a phase in the cycle of *tetragena* it is a very well defined and singularly distinct phase, and its inclusion in the *tetragena* (*histolytica*) species will necessitate the relinquishing of several criteria now in use for classification.

We ourselves think it is quite likely that this form is really distinct from *E. histolytica*+*tetragena*, and constitutes a third, independent form of *Entamoeba* occurring in man, either a distinct species or else a distinct variety. With one exception all our cyst carriers are well in the post-dysenteric stage of the disease; but they are all passing the typical *tetragena* cysts. We have never found a *tetragena* cyst less than $10\frac{1}{2}\mu$ in diameter, though slightly smaller ones are stated to occur occasionally. But when they do, they are always associated with cysts of the normal size. The vast majority of the cysts we have seen have not varied more than 1μ from 12μ in diameter. On the other hand, on no occasion have we found a *minuta* cyst larger than 8μ. We do not lay any stress on the rarity of the occurrence of cysts with 4 nuclei, because it occasionally happens that in preparations of *tetragena* cysts, the great majority found have only one or two nuclei. It may be, perhaps, more usual for the cysts of this *minuta* form to be passed in the earlier stages of development than it is in the case of *tetragena*. (The size of the cyst is the same, of course, in the 4-nuclear stage as it is in the 1 or 2 nuclear stage.)

In what relation this form stands to the production of amoebic dysentery—for example, whether it produces a mild type only—we are not able to say from the evidence so far available; because, as stated above, this particular case showing these cysts may have had bacillary dysentery as well. It may be pointed out, however, that, even if this is so, there is no reason to suppose that the characteristic small size of these cysts represents an abnormal phase—for example, due to the simultaneous occurrence of bacillary dysentery—since the special case, not included in our own series, where there is undoubted evidence of Shiga, is passing the typical *tetragena* cysts. It is probable that this *E. minuta* is also affected by emetine, because of the cessation of the appearance of the cysts in the stools for more than a fortnight after four doses had been given. We consider it is important to draw attention to these small cysts, in view of their possible further occurrence, since they are quite likely to be overlooked, or at all events regarded as having nothing to do with *E. tetragena* cysts, or with amoebic dysentery.

THE TREATMENT OF LAMBLIA INFECTIONS.

There is no doubt that heavy *Lamblia* infections are often distinctly pathogenic, being the cause of marked diarrhoea. This may be intermittent, or cease for a period, but is very liable to recur owing to exposure, indiscretions in diet, and so on. A *Lamblia* infection is apparently more active, and the cause of greater intestinal derangement in warmer countries, for example, the Mediterranean

area. Men now in England with a heavy, persistent infection, even though no longer inconvenienced by diarrhoea, would be extremely likely to suffer from a return of the complaint on proceeding again to a warmer climate. Of the 22 cases in which *Lamblia* has been present in the faeces, at least 6 have been very heavy infections. One instance has been already given in our previous note. Another case has been in the hospital for more than four months, and during this period every examination of the stools has shown enormous numbers of cysts, with, now and again, when the stool was very loose, many unencysted (active or inactive) forms in addition. Several efforts have been made to get rid of these troublesome parasites, but up to the present, unfortunately, we cannot say that a specific mode of treatment has been found. To certain of the resident medical officers, especially Drs. G. Dawson and F. J. McCarthy, who have been in charge of most of the cases concerned, we are greatly indebted for their cordial co-operation in these attempts.

Treatment.

The varying success obtained with different drugs may be briefly indicated.

The first case in which the parasites were found was also a case of bacillary dysentery. *Lamblia* occurred in enormous numbers for a period of about a week. The patient was given beta-naphthol 15 grains, with bismuth salicylate 20 grains, thrice daily, for some days. By the end of three weeks from the time of the first observation not a single flagellate or cyst was any longer to be found. Owing to other causes, this patient has remained in the hospital for six months; during this time the stools have been examined on several occasions, the last examination having been made only a few days ago. No sign of a flagellate infection, whether of active forms or cysts, has been again found. We may regard this case, therefore, as having been probably cured by the mixture.

Two other cases were treated with turpentine (térébenthine), following the opinion of various French workers as to its value. The dose was 10 minims, three times a day, for four or five days. This was followed by guaiacol carbonate, recommended to us by Dr. Thomson, 5 grains thrice daily, for a day or two before the stools were examined, but probably not long enough to have much effect. When the examination was made, in one case no cysts were found; in the other, after much searching, a few dead-looking cysts were seen. Four days later both stools were again examined, and in neither case were any cysts found. The patients were then sent out of the hospital. We cannot say, of course, definitely that no recurrence has taken place, but from our experience in the first case we consider this unlikely.

On the other hand, in two other cases, none of the remedies tried up to the present has produced any effect. Turpentine, guaiacol, thymol have all failed.

Beta-naphthol, together with bismuth salicylate, then, appeared to effect a complete cure in the only case in which we have been able, so far, to give the former drug. "Térébenthine," in small doses, for some days, was also apparently successful in two cases, but has failed in two others. We have not yet tried giving this drug in a single large dose.

MALARIA.

Altogether, 14 cases of malaria have occurred in the hospital up to the present. Of these, only two have been due to the pernicious parasite (*Laverania malariae vel praecox*), in which cases both small rings and crescents (gametocytes) were found. All the other cases have been due to the benign tertian parasite (*Plasmodium vivax*). We have had no instance of a mixed infection.

Postscript.—Since sending the above paper to press we have been able to treat another case of heavy chronic *Lamblia* infection by the administration of beta-naphthol and bismuth salicylate. The case was that already referred to as having been in the hospital four months, and other drugs had not made any impression on the parasites. The stool was examined a few days ago, after three days' treatment as above. No *Lamblia* cysts were found in the faeces. If their disappearance proves to be permanent, as in the first case, a good trial with the combined beta-naphthol and bismuth salicylate appears indicated in cases of heavy *Lamblia* infections. We are inclined to think that the bismuth salicylate is at least as important a factor as the beta-naphthol.

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SPIROCHAETES AND THEIR GRANULE PHASE.

BY

H. B. FANTHAM, M.A.CANTAB., D.SC.LOND.,

LECTURER ON PARASITOLOGY, LIVERPOOL SCHOOL OF TROPICAL MEDICINE.

SPIROCHAETES are thin, delicate, undulatory organisms which are widely distributed in Nature. Some of them are free-living and occur in stagnant water or in sea-water. Others live in the digestive tracts of animals, both vertebrate and invertebrate. In man *Spirochaeta buccalis* and *S. dentium* may be found in the mouth and *S. bronchialis* in the respiratory tract, while *S. eurygyrata* and *S. stenogyrata* may occur in human faeces. Also, *S. balbianii* is a well-known species found in the intestinal caecum and crystalline style of oysters and allied Lamellibranchs. Other spirochaetes occur in the tissues of vertebrates, and are often pathogenic. The causal agents of relapsing fever, such as *S. recurrentis* and *S. duttoni*, occur in the blood during the pyrexial periods. Another of these organisms—*S. schaudinni*—is found in tropical ulcers. Yet other spirochaetes, often placed in a separate genus *Treponema*, are the causal agents of syphilis and of yaws, and are known respectively as *Treponema pallidum* and *T. pertenue*.

Probably the longest spirochaetes are among those found free-living. Such an one is *S. plicatilis*, which may reach 200 μ in length. On the other hand, *S. laverani*, found in the blood of mice, is a very short form, and may be only 3 μ long. Spirochaetes may vary from 0.25 μ to 2 μ in width. The outline of the body of one of these Protista is corkscrew-like, and varies in appearance owing to its great flexibility. Quickly moving spirochaetes show many waves of small amplitude, while slowly moving forms present fewer, larger waves of greater amplitude. Hence it will be seen that it is hardly accurate to take as specific characters the number of undulations or coils found in fixed and stained specimens of spirochaetes. The number of turns or waves is, then, more an index of rate of motion—as well as of thickness, which is also a factor—than one of differentiation between various species. Further, owing to the processes of growth and division, the latter occurring by binary fission, there is much morphological variation among spirochaetes. This polymorphism results in differences in length and breadth within the same species, variations which tend to be overlooked unless a large number of specimens from a series of cases is examined and measured.

Internally, spirochaetes possess chromatin bars, rodlets, or granules distributed evenly along their body length. These chromatin granules are seen only with great difficulty in the smaller forms.

Spirochaetes of vertebrates may be transmitted from host to host directly by the contaminative method, or by the intermediation of an arthropod vector. Examples of the former are the causal organisms of syphilis and of yaws, while examples of the latter are the parasites of relapsing and African tick fevers. A consideration of the life-cycles of spirochaetes leads to a discussion of their granule phase, or capacity for "granule shedding," as it has been termed, a most interesting phenomenon around which a certain amount of controversy has centred. There is no doubt that spirochaetes produce such granules; it is only their significance, whether cyclical or degenerative, that is in question.

One of the spirochaetes best investigated with respect to granule formation is *S. duttoni*, which is transmitted from man to man by the tick *Ornithodorus moubata*. The life-cycle of this spirochaete was first outlined by Dutton and Todd in 1907, and was studied in detail by Leishman in 1909–10. Leishman's results essentially were that spirochaetes gave rise by multiple fission to granules or coccoid bodies inside the invertebrate host, and that these granules or coccoid bodies found their way more especially to the Malpighian tubules, gonads, and other organs of the tick. The granules themselves multiplied. The eggs of the female tick became infected with granules, and the progeny of infected females might be born infected. The observations of Leishman have been confirmed and extended by Balfour (1911), Fantham (1911), and Hindle (1911). The organisms investigated were *S. duttoni*, *S. recurrentis*, and *S. gallinarum*, or varieties of the last. The formation of

granules in *Treponema pallidum* and in *T. pertenue* has been recorded by Balfour, by Ranken, and by Hoffman. It has also been observed in *Spirochaeta bronchialis* by Fantham in 1914–15. Similar multiple transverse fission has been seen in the larger molluscan spirochaetes—for example, *S. balbianii* and *S. anodontae*, by Bosanquet (1911), Fantham (1911), and Gross (1912). It may be mentioned that, even as early as 1882, Zopf recorded and figured the formation of micrococcoid and bacillary forms from spirochaetes of stagnant water and of the teeth, and stated that these forms stand in genetic relationship to one another.

The formation of coccoid bodies, as observed by me in various spirochaetes in fresh preparations, with or without the use of dark-ground illumination, is as follows:

The cytoplasm at first is very finely granular, in fact, almost homogeneous. The chromatin bars appear as minute refractile masses. A concentration of some of the cytoplasm occurs around each chromatin rodlet. These small concentrations gradually become oval, the outer cytoplasmic layer differentiates as a thin coat, and ultimately a series of coccoid bodies or granules is formed, lying usually transversely or slightly obliquely within the periplast sheath. Sometimes the coccoid bodies are set at liberty by a rupture appearing at one end of the spirochaete; at other times, several ruptures, or disintegration of the sheath, can be observed. Stained specimens show a series of darker, lozenge-like coccoid bodies alternating with relatively clear, pale-staining areas. Within the Malpighian or genital cells of a transmitting tick, and in certain mononuclear sputal cells penetrated by *S. bronchialis*, the coccoid bodies often seem to be liberated by the disintegration of the periplast. Groups of coccoid bodies still retaining the outline of the spirochaete from which they originated are of fairly frequent occurrence. When the coccoid bodies are released by a terminal rupture of the parent they tend to form irregular clumps. The progressive elongation of the granules, the assumption of the sinuous form, and the emergence of very small spirochaetes from the groups of granules have been observed in life. It is very probable that there is a definite period in the life of a spirochaete at which there is a marked differentiation of coccoid bodies. It must also be borne in mind that coccoid bodies may be present when spirochaetes as such cannot be detected. At the same time, the finding of chromatinic granules alone is not sufficient to justify the inference that spirochaetosis is indicated, as all such granules are not necessarily spirochaetal in origin. It is essential that motile spirochaetes should be found at some period of the disease, and the developmental stages leading to granules or coccoid bodies observed *in vivo*.

The coccoid bodies have been otherwise interpreted by Marchoux and Couvy (1912–13), Blanc (1911), and Wolbach (1914), who seem to consider these bodies either to be degenerative or to be unconnected with the life-cycle of spirochaetes. According to the first-named investigators, who worked on *S. gallinarum* in *Argas persicus*, the spirochaetes within an infected tick retain their spirochaetal facies, becoming at times so attenuated that they may cease to be visible, some having been observed already on the limits of visibility. Naturally, the question forces itself as to how it is possible to determine the spirochaetal facies if the organism has become invisible. Further, they state that granules occur in the Malpighian tubules, ova, and genital ducts of normal ticks and other arachnids, and that these have been mistaken by Leishman and his supporters for spirochaetal granules. However, it has not been denied that granules may occur in normal tick cells, nor was it asserted that all intracellular granules in infected ticks were spirochaetal in origin, for the granules seen in arachnid cells are not all of the same nature.

Regarding the development of *S. recurrentis* or its varieties in the louse, *Pediculus vestimenti*, Sergent and Foley (1914) state that the spirochaete in the louse assumes a very small form which is as virulent as the spirochaetiform stage. During eight days following a meal of infected blood the body of the louse does not contain any spirochaetes as such, though the spiral organisms reappear later, as was first observed by Nicolle, Blaizot, and Conseil in 1912. Very probably this minute form will be found to be of the nature of a Leishman granule or coccoid body. Also, Nicolle and Blanc (1914) find that the causal agents of relapsing fever are virulent or infective in the louse just before they reappear as spirochaetes. They think that there is an invisible stage in the life-cycle, though they do not appear to have examined for a granule stage, which might easily be overlooked. Further, it should be noted that in experiments with the invertebrate transmitters of such spirochaetes as *S. duttoni*, *S. recurrentis*, and *S. gallinarum*, careful attention should be paid to the temperature, humidity, and other climatic conditions under which the investigations are conducted, since these factors undoubtedly influence the development of spirochaetes therein.

Granule stages have also been recorded from time to time in spirochaetes in the blood of vertebrates. Thus, Balfour, in 1908, found such bodies in the red blood corpuscles of Sudanese fowls suffering from spirochaetosis. Prowazek, in 1906, recorded intracorpuscular stages of *S. gallinarum*. Breinl (1907) and others have observed encysted forms of *S. duttoni* in the spleen, which forms broke into granular bodies that gave rise to new generations of spirochaetes. Sergent and Foley (1914) also found that a minute but infective form occurred in the blood of patients suffering from relapsing fever during apyretic intervals when spirochaetes were absent. Personally, I have seen a very few of these spirochaetes on rare occasions breaking up into coccoid bodies in the blood of the vertebrate host. These minute bodies may appear to occur in or on the red blood corpuscles. They may be found at the crisis and may possibly explain the "after-phase," and may be connected with relapses in the vertebrate host. It is also interesting to note that Sir Patrick Manson, in his well-known book on tropical diseases, writes as follows regarding the etiology of relapsing fever: "Obermeier and von Jaksch describe certain refractile bodies present in the blood during the fever intermissions. The latter author says that he has observed the development of these bodies into short rods, from which the typical spirochaetes are eventually evolved."

Again, the passage of *S. bronchialis* from man to man is most probably by means of the coccoid bodies that leave the human host in the spray with expired air and by way of nasal secretions, as was shown by the present writer in 1914 and 1915. Linen soiled by such secretions, and indiscriminately packed with other soiled clothing, may also aid. Owing to the fragility and short life of *S. bronchialis* extracorporeally, the resistant coccoid bodies in air, dried sputum and dust, and possibly also on the bodies of flies and other insects, are probably instrumental in inducing attacks of bronchial spirochaetosis in human beings, especially those having a lowered bodily resistance, such as after a chill.

A historical interest attaches to the *Cytoryctes luis* of Siegel. These structures are probably explained by the granules shed by *Treponema pallidum* (*Spirochaeta pallida*).

Further evidence for the transition and growth of granules or coccoid bodies into spirochaetiform organisms may be briefly mentioned. Thus, Noguchi (1911), in his paper on the cultivation of *Treponema pallidum*, records in the explanation of one of his figures that "it is not rare to find a round body connected with one or two young *pallida*, as though the latter were just sprouting from the former." Balfour (1913) thinks that he seems to have succeeded in growing spirochaetes *in vitro* from infected tick eggs in which granules only could be demonstrated. Sir William Leishman (1913) repeated many of his former experiments with altered technique, employing dark-ground illumination instead of fixation and staining. He finds that "the granule clumps are not all alike, but that some of them show a much higher degree of refractility than others. Continuous observation of these refractile granules, with the microscope in a thermostat, has further shown me, in the case of two ticks, the definite extrusion of small and actively motile spirochaetes from these granule clumps. . . . After about ten days at a temperature of 28° C. to 30° C., and with a relatively high humidity, some of these clumps give rise to young spirochaetes, which become free, are actively motile, multiply by fission, and may persist in the tissues of the tick for many months."

In conclusion, the value of the recognition of the granule phase in the Spirochaetacea has been strikingly set forth by Noguchi, who, in an address given before the Royal Society of Medicine in London on October 20th, 1913, stated that he "was able to demonstrate . . . granules in the pure cultures of *Treponema pallidum*. This phenomenon, however insignificant it may appear in itself, was destined to furnish a key to one of the most

disputed problems of the past fifty years—namely, the problem of so-called parasyphilis, since it was this very idea that prompted me to undertake to search for *Treponema pallidum* in one form or another in the brains of general paralytics and in the spinal cord from cases of tabes dorsalis." And again, "I was led by the observation that *Treponema pallidum* sometimes assumes a granular form in cultures to re-study sections of paretic brains stained for the *pallidum*."

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ON THE RELATION BETWEEN THE TERMINAL-SPINED AND LATERAL-SPINED EGGS OF BILHARZIA.

BY LIEUT.-COL. R. T. LEIPER, D.Sc., M.B., R.A.M.C.,

WANDSWORTH RESEARCH SCHOLAR, LONDON SCHOOL OF TROPICAL MEDICINE; READER IN HELMINTHOLOGY IN THE UNIVERSITY OF LONDON.

THE final chapters of my report on the investigation into the mode of spread of bilharziosis in Egypt may not be issued for some time yet owing to my continued absence abroad. I have the kind permission of the editor of the *Journal of the Royal Army Medical Corps* to publish now a short summary of the results obtained in so far as they bear upon the etiological relation of vesical and intestinal bilharziosis and the explanation of the position of the spine in the eggs which give rise to these two distinct clinical manifestations of bilharzia infection. This question has been for years the subject of widespread discussion, but hitherto no finality has been reached.

The controversialists have arranged their arguments and facts around two principal theories.

(*a*) Looss's theory maintains that the terminal-spined eggs are the normal product of impregnated females of *Schistosoma haematobium*, while the lateral-spined eggs are those produced parthenogenetically where males have not developed.

(*b*) Manson's theory, based upon the constant and peculiar shape of lateral-spined eggs, their peculiarly limited geographical incidence, and their special selection for the intestinal tract, hypothesizes a zoological distinction in the adult parasites.

An examination of the fresh-water molluscs at El Marg during the spring and summer of 1915 showed that three species, *Bullinus contortus*, *Bullinus dybowski* (that is, the "*Physa alexandrina*" of Looss), and *Planorbis boissyi*, were infected with certain cercariae, which developed in mice under experimental conditions into bilharzia worms. These worms produced eggs of two kinds—namely, some with typical terminal spines and others with typical lateral spines.

By submitting individual mice, each on one occasion only, for a limited period to infection with the cercariae from single infected molluscs it has been possible to demonstrate that those developing in the *Bullinus* molluscs always produce bilharzia worms which give rise solely to terminal-spined eggs, while those which have developed in *Planorbis boissyi* always become worms which produce solely lateral-spined eggs. In all the experiments males developed and were more numerous than the females.

The cercariae found in *Bullinus*, although very similar to those found in *Planorbis*, showed differences in the suckers, in the relative length of tail, and in other minute points detailed in my final report. The adult worms experimentally reared also showed constant morphological differences. In the worms derived from *Bullinus* spp. the males have four or five large testes and the two lateral gut branches are late in uniting, so that even when mature the worms have a short intestinal caecum. In the female the ovary lies in the latter half of the body. The uterus is very long, voluminous, and contains many terminal-spined eggs, some of which lie in pairs. The yolk glands have a limited range in the posterior fourth of the body. These worms belong to the species *Schistosoma haematobium* (*sensu stricto*). In the worms derived from *Planorbis boissyi* the males are small, and have eight small round testes. The two lateral gut branches unite very early. In some of the smallest specimens found this union had already taken place. The intestinal caecum is correspondingly very long. The female has the ovary in the anterior half of the body. The uterus is very short, and almost invariably there is one egg only at a time in each specimen even when a number have already been laid. The yolk glands are extensive, ranging through the posterior two-thirds of the body along the whole length of the caecum. The eggs always have a lateral spine, the first laid is usually smaller than those succeeding, and the spine is then set almost at right angles to the long axis. Pending a consideration of the claims of other names to priority the specific name *Schistosoma mansoni* may be adopted rightly for these worms. They differ in their adult structure from *Schistosoma haematobium* (*sensu stricto*) more markedly than does *Schistosoma bovis*.

Vesical bilharziosis and Manson's intestinal bilharziosis are therefore etiologically properly regarded as entirely distinct diseases.

IODINE IN TETANUS.

BY

A. T. MACCONKEY, M.B., D.P.H.,

AND

S. S. ZILVA, PH.D.

(FROM THE SERUM DEPARTMENT, LISTER INSTITUTE.)

WHILE the value of iodine as an antiseptic has recently been the subject of discussion, no reference has been made to the well-established facts that iodine possesses the power of rendering tetanus toxin non-toxic, and that such a modification of this toxin can produce active immunity.

An example of this effect is shown in the first table.

TABLE I.—*Results of Injecting Subcutaneously into Guinea-pigs a Mixture, consisting of Equal Parts of Gram's Solution of Iodine and of Tetanus Toxin, some of which had been kept at 36° C. and some at Room Temperature for Different Periods before Injection.*

Weight of Guinea-pig in Grams.	Quantity of Mixture Injected.	Time and Temperature.	Day after Inoculation.						
			1	2	3	4	6	10	14
340	1 c.cm.	2 hrs. at 36° C.	—	—	—	—	—	—	—
380	1 c.cm.	2 hrs. at R.T.	—	—	—	—	—	†	—
310	1 c.cm.	1 hr. at 36° C.	—	—	—	—	—	—	—
365	1 c.cm.	1 hr. at R.T.	—	—	—	—	†	††	††
310	1 c.cm.	½ hr. at 36° C.	—	—	—	—	†	—	—
380	1 c.cm.	½ hr. at R.T.	—	—	—	—	††	††	†
375	1 c.cm.	¼ hr. at 36° C.	—	—	—	—	†	—	—
350	1 c.cm.	¼ hr. at R.T.	—	—	—	—	††	†	—
355	1 c.cm.	At once	—	—	††	†††	+		

R.T. = Room temperature.

Of this toxin, $\frac{1}{300}$ c.cm. killed a guinea-pig of about 350 grams weight in four to five days, and it is obvious that the iodine, when mixed with it, had an immediate effect, but not enough to prevent a fatal result. As the period of contact before injection increased, so did the effect of the iodine become more marked, until the mixture ceased to give rise to any symptoms of tetanus.

The immunizing effect of such a mixture is seen in Table II, which gives details of an experiment in which an iodine-toxin mixture was given in repeated doses.

TABLE II.—*Immunizing Effect of a Mixture of Equal Parts of Gram's Solution of Iodine and Tetanus Toxin. The Mixture was kept for Two Hours at 36° C. before Injection Subcutaneously.*

Date of 1st injection February 24th, 1913.

No.	Weight of Guinea-pig in Grams.	Quantity of Mixture Injected.	Date. Mar. 1.	Mar. 6.	Mar. 11.		Mar. 17.
		c.cm.					
1	315	1	—	?	—	Each animal received 1 M.L.D. of toxin. All died within 8 days.	
2	335	1	—	?	—		
3	360	1	?	?	—		
4	350	1	—	—	—		
5	320	1	—	—	—		
6	335	1	—	—	—	Each animal received 2 c.cm. of iodine-toxin mixture.	—
7	375	1	—	—	—		—
8	330	1	—	—	—		—
9	325	1	?	?	—		—
10	320	1	—	—	—		—
11	315	1	—	?	—		—
12	335	1	?	?	—		t *
13	330	1	—	—	—		t
14	340	1	—	—	—		—
15	315	1	?	?	—		t
16	330	1	?	?	—		—
17	320	1	—	—	—		—
18	330	1	—	?	—		+ **
19	355	1	?	—	—		t
20	360	1	—	—	—		t
21	335	1	?	t	?		t
22	315	1	?	?	—		t

* No further injection; died April 16th. ** Died March 15th

On March 27th guinea-pigs No. 6–10 each received 1 M.L.D. of toxin; the remaining animals, which were quite well (Nos. 11, 13–17, and 19–22), each received 3 c.cm. of iodine-toxin mixture. All the animals remained quite well.

On April 16th ten animals (Nos. 6–11 and 13–16) each received 2 minimal lethal doses of toxin; the remainder (Nos. 17 and 19–22) each received 5 c.cm. of iodine-toxin mixture. All the animals remained quite well.

On May 1st the animals received the following minimum lethal doses: Nos. 6 and 7, 4 doses; Nos. 8 and 9, 6 doses; Nos. 10 and 11, 8 doses; Nos. 13 and 14, 10 doses; Nos. 15 and 16, 12 doses; and Nos. 17 and 19–22, 4 doses. All the animals remained quite well.

On May 17th the animals Nos. 6–14 each received 100 minimal lethal doses, and Nos. 15–22 each received 50 doses. All the animals remained quite well.

NOTE.—The M.L.D. was 0.000006 gram of a dry standard toxin, and was given beneath the skin of the abdomen. The ? refers to animals which, on palpation, seemed somewhat stiff about the shoulders, but showed no definite signs of tetanus. t = Tetanus. + = Death.

A consideration of the table shows that a single dose of the mixture does not produce enough immunity to protect against one minimal lethal dose (1 M.L.D.) of tetanus toxin. Confirmation of this is afforded by other experiments in which 29 guinea-pigs received subcutaneously doses of iodine-toxin mixture varying from $\frac{1}{10}$ c.cm. to 6 c.cm., and every one of them succumbed to 1 M.L.D. of tetanus toxin given from eleven to twenty-six days later. We see further that two doses of iodine-toxin mixture produced active immunity to 1 M.L.D., while three and four doses protected against two and four M.L.D.'s respectively. It is possible that the immunity produced was greater, but we cannot say so definitely, as four M.L.D.'s was the highest test dose used.

Such observations naturally suggest the thought that iodine might prove of value as a curative agent in tetanus. Auregan (1915[1]) published a series of cases in which he had given a 20 per cent. "ultra finely granular oleaginous suspension of electro-chemical 'colloidal' iodine" with beneficial results. He gave it intramuscularly, but does not mention the size of the doses.

As the treatment of declared tetanus cannot be said to be as yet very successful, it seemed desirable to test experimentally the claim made by Auregan for the use of iodine in tetanus. We therefore carried out a number of experiments on guinea-pigs with this object in view.

In these experiments four guinea-pigs were used for each series. The toxin employed was the same standard test toxin as was used in the previous tests, and each animal received 1 M.L.D. subcutaneously. Twenty-four hours after the injection of the toxin only very slight symptoms of tetanus, or none, were to be observed, and therefore it may be said that the incubation period was about one day. The doses of iodine given in each series were 0.2 c.cm., 0.3 c.cm., 0.4 c.cm., and 0.5 c.cm., except in Series 8, when they ran from 0.1 c.cm. to 0.4 c.cm. Each dose of serum contained 500 U.S.A. units of antitoxin.

When the serum and iodine were inoculated at the same time, they were not mixed before injection, but were given simultaneously in separate places. When an animal received several doses of iodine or of serum, they were all of the same size.

TABLE III.—*Experiment to Ascertain the Curative Effect of a 2.5 per cent. "Colloidal" Iodine Preparation alone and in conjunction with Tetanus Antitoxin.*

Series.	Treatment.	No. of Recoveries, with Doses they Received.	Deaths.
1	Controls; no treatment	None	All within 4 days.
2	Iodine, 24, 43, and 48 hours after toxin	One. 0.4 c.cm. of iodine	3 within 3 days.
3	Iodine, 43 and 48 hours after toxin	One. 0.5 c.cm. of iodine	3 within 3 days.
4	One dose of iodine and of serum, 24 hours after toxin	One. 500 U.S.A. units of antitoxin and 0.5 c.cm. of iodine	3 within 5 days.
5	Serum and iodine, 24 hours, and iodine, 43, 48, 67, and 72 hours after toxin	None	3 within 4 days; 1 within 7 days.
6	Serum alone, 24, 43, 48, 67, and 72 hours after toxin	Three. 500 U.S.A. units of antitoxin	1 within 8 days.
7	Serum alone, 43 and 48 hours after toxin	None	4 within 4 days.
8	Serum and iodine, 24, 43, 48, 67, and 72 hours after toxin	Two. 0.2 c.cm. iodine and 500 U.S.A. units of antitoxin; 0.4 iodine and 500 U.S.A. units of antitoxin	2 within 4 days.
9	Serum and iodine, 43 and 48 hours after toxin	None	4 within 2 days.

A decidedly curative effect cannot be ascribed to this preparation of iodine, though some recoveries followed its administration, for the largest number (3) of animals that survived in any one series was in that which received repeated doses of serum alone; repeated doses of serum together with iodine gave two survivals, while iodine alone was followed by three deaths.

We then experimented with iodargol ("*Iode colloïdal électro-chimique, pur et stable*"), which is said to contain 25 cg. of iodine in 1 c.cm. All inoculations were made subcutaneously. The toxin was the same as before.

TABLE IV.—*Effect of Iodargol. (Six Guinea-pigs, each weighing 340 grams.)*

Toxin Injected.	Iodine Injection after 3 Hours.	Day 1 after Inoculation. 9 a.m.	Day 1 after Inoculation. 3 p.m.	Day 2.	Day 3.	Day 4.
Oct. 27, 1915. 1 M.L.D. 2.15 p.m.	Control; no iodine	—	No iodine	t	+	
,, ,,	0.25 c.cm.	—	0.25 c.cm.	0.25 c.cm.	t	tt	+
,, ,,	0.5 c.cm.	—	0.5 c.cm.	0.5 c.cm.	t	+	
,, ,,	0.75 c.cm.	III		+			
,, ,,	1.0 c.cm.	—	1.0 c.cm.	1.0 c.cm.	t	+	
Nov. 5, 1915. 1 M.L.D. 11 a.m.	5.0 c.cm.	—	No iodine			tt	+

There is little doubt that iodargol had no favourable influence upon the course of the disease.

In other experiments injections of "colloidal" iodine were given before and three hours after the toxin without any beneficial results.

Further, we tested the effect of a preparation of iodine and soluble starch which neutralized tetanus toxin *in vitro*, but it proved quite ineffective as a curative agent. On one occasion the animals did survive, but this result seemed mostly accidental, for the injections were inadvertently made too close together, and the swelling caused by the injection of toxin joined to that due to the iodine, and thus the latter may have come into direct contact with the toxin before it was absorbed. When this experiment was repeated, care being taken to place the injections far enough apart to prevent direct mixing, the result was death of both the animals.

CONCLUSION.

We are forced to come to the disappointing conclusion that iodine injected subcutaneously has no effect upon tetanus toxin which has been also injected subcutaneously in a different place.

We cannot, therefore, hope to influence favourably the course of an attack of tetanus by injections of iodine alone, nor does iodine appear to have any effect in enhancing the power of serum.

It would seem, then, that iodine can only be of use when applied to the infected focus, so that it can come into direct contact with the toxin before absorption.

REFERENCE.
[1] *Lancet*, 1915, i, p. 430.

THREE CASES OF ABDOMINAL GROWTHS PRESENTING VERY UNUSUAL CHARACTERS.

BY CHARLES A. MORTON, F.R.C.S.,
PROFESSOR OF SURGERY, UNIVERSITY OF BRISTOL; SENIOR SURGEON TO THE GENERAL HOSPITAL, AND THE CHILDREN'S HOSPITAL.

CASE I.—*Tumour Composed of many Hydatid Cysts Growing within the Abdomen, and Protruding into an Umbilical Hernia so as to form a Large Pendulous Growth.*

A WOMAN, S. H., aged 39, was admitted to the General Hospital in April, 1914, with a very hard, heavy, lobulated

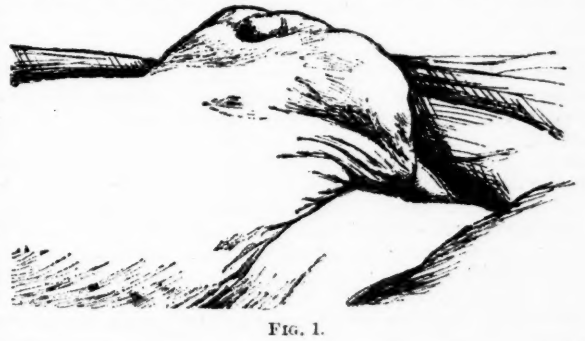

FIG. 1.

mass protruding at the umbilicus (Fig. 1). There were some round elastic nodules on its surface. The umbilicus was lying on it, and it was sent to the hospital as an umbilical hernia. It measured 7 in. by 6½ in. When the patient stood up it hung down (as shown in Fig. 2) so far that the *upper surface* came as low as the pubes. Because it was so heavy it dragged down the abdominal wall in a funnel-shaped form with it. She always had to support it when her bowels acted. A number of firm round nodules could be felt extending from it, up under the abdominal wall. It was clearly not a simple umbilical hernia, but some form of growth, perhaps extending into the sac of an umbilical hernia, but the nature of the growth was not suspected.

FIG. 2.

At the operation on April 14th I found there was an umbilical hernia, and that a very thick mass of omentum passed out of the abdomen into it. To the distal end of this, lying in the hernia, a large lobulated tumour was attached. The abdomen was full of cysts, some quite small and others the size of duck's eggs. They occupied every part from the pelvis to the diaphragm, some lying under the stomach. I was able to divide the omentum, connecting the colon and the cysts within the abdomen with the umbilical tumour, and then removed the tumour mass with the overlying skin, and brought the edges of the umbilical opening together by the overlapping method. The umbilical tumour weighed 3 lb. 8 oz., and was composed of a number of the same kind of cysts as those within the abdomen, fused together. I found they were typical hydatid cysts. The patient made a good recovery, and returned to South Wales. In answer to a letter of inquiry as to her present condition sent last July, the only information she supplied, with regard to her abdominal condition, is contained in these words: "I am getting on all right, and don't feel no ill effects in the stomach."

CASE II.—*Sarcoma of the Small Intestine causing Recurrent Attacks of Obstruction.*

A woman, R. S., aged 44, was sent to me at the General Hospital in October, 1914, by Dr. Graham, of Watchet, with recurrent attacks of abdominal pain. She had the first attack two years before I saw her, the second one year before. For some time before I saw her she had been getting the attacks every few days. In April she had a very severe one, lasting several days, and requiring hypodermic injections of morphine. All the attacks, even the one two years before I saw her, were of the same character; the pain was either just at the umbilicus or close to it, and was usually most severe at the umbilicus. It was of a griping character, and after lasting some hours she generally vomited, and then the pain either diminished or ceased. She said she was generally distended when in pain. She suffered from habitual constipation, but for some time she had had no action of the bowels without aperients or enemata. The vomit was bile, and there was no history of either haematemesis or melaena. For a month before I saw her she had been on liquid diet only, with the exception of a small quantity of bread, but had had severe attacks every few days. When she had been taking ordinary diet the attack used to come on two or three hours after dinner.

On admission there was nothing abnormal to be made out in the abdomen, but when seen in an attack of pain I found considerable distension in the lower abdomen, and once I could make out a distended coil. I thought the attacks were due to intestinal obstruction, probably from adhesions. I operated on October 20th, and found the obstruction due to a growth in the small intestine. The coil containing the growth was lying quite free in the pelvis. It must have been about the middle of the small

intestine, for after tracing the gut in each direction from it I failed to arrive at either the caecum or the duodeno-jejunal junction. The bowel on the proximal side was greatly dilated and thickened. The growth was hard and at parts leucoplakic in appearance, and was spreading into the mesentery. It resembled a very large reel, for it was constricted in the centre and had a kind of rim where the bowel wall joined it, just such a rim as one makes on tying the rubber tube on a Paul's intestinal glass tube. It occupied 2½ in. of the bowel and was 2 in. in thickness. There were no secondary growths in the liver, nor any glands in the pancreatic region, but there were a few quite small glands clustered together at the root of the mesentery corresponding to the growth, and a few in the mesentery between these and the growth. Those lying quite close to the growth were removed with it, but microscopic section, made at a later date, did not show any growth in them. I resected the growth, together with 3 in. of the intestine above and below it, and united the ends, and then brought the united bowel through the opening in the parietal peritoneum, the edges of which I united to it, so as to exclude it from the general peritoneal cavity in case of leakage. This, of course, prevented my uniting the deep abdominal wall in the part corresponding to the protrusion of the united bowel, and she will have to guard against extension of the ventral hernia thus produced, by a belt; but by fixing the united bowel in this way outside the peritoneal cavity the serious danger of the operation—that is, leakage from the junction—was avoided. I put a drainage tube by the side of the bowel. There was never any leakage, and she made a good recovery, but during the first few days after the operation she had attacks of abdominal pain, evidently due to obstructed passage of intestinal contents through the united portion of bowel.

The growth was semitranslucent, white and firm, and at its junction with bowel lumen protruded into it like the os uteri into the vagina. The lumen through the growth was so greatly narrowed that only a small pair of

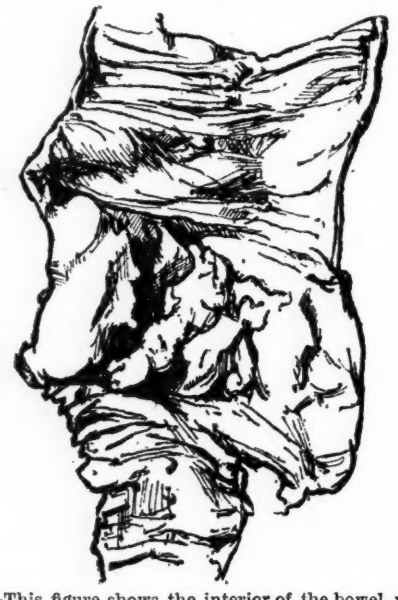

FIG. 3.—This figure shows the interior of the bowel, which has been laid open by a longitudinal cut extending also through the growth, and is spread open. The difference in size of the bowel on the proximal and distal sides of the growth is well shown in the illustration.

artery forceps could be passed through it (see Fig. 3). Microscopical section of several parts of the growth showed round celled sarcoma.

CASE III. — *Malignant Growth of the Colon causing Obstruction, and Associated with Phthisis in a Young Man of 21.*

H. W. was sent to me on October 26th, 1914, at the General Hospital, by the late Dr. Eglington of Street. He had had pain in the left side of the lower abdomen and in the epigastrium for two months, and a small lump had been observed in the left lower abdomen. He had been in a sanatorium for some time, but a week before I saw him his bowels had ceased to act and he began to vomit, and he was then sent home from the sanatorium to the care of Dr. Eglington at Street. He had had repeated enemata without effect, and the abdomen become distended, and during the twenty-four hours before admission the abdominal pain became very severe. On admission there was considerable abdominal distension, and a small hard lump about the size of a finger-tip could be felt in the left lower abdomen, just above the middle of Poupart's ligament. It was fixed, but fairly superficial. There was a distended coil in the right lower abdomen. No swelling could be made out on rectal examination. There were no physical signs of disease in the chest. The pain had ceased, and he did not vomit. He was fed on albumin water, and had several hot turpentine enemata, and as a result of these he passed a considerable amount of flatus, and the pain did not recur to any extent, nor did he vomit. The distension considerably diminished, and the lump in the left lower abdomen became more distinct. As, however, by the 30th no faecal action had been obtained, I felt obliged to operate. I expected to find—what had been diagnosed before admission—a tuberculous lesion causing the obstruction.

On October 30th I made an incision through the middle of the left rectus, low down. There was a little clear serum in the peritoneum. Two inches of the iliac colon were converted into a hard, smooth cylinder, with a white scar-like appearance of the peritoneum covering it. There were a few yellow nodules on it, and a thickening of the fatty tissue attached to it. It was movable on the floor of the iliac fossa, and the surrounding structures were not adherent to it. It was not at all like a constricting carcinoma. The yellow nodules on it were not like caseating tubercle; they were more of a golden colour, and may have been altered fat. I could not decide whether the lesion was tuberculous or new growth. I could easily have excised it, and should have done so but for the additional disease present. This consisted of hard nodules attached to the transverse colon, and the parietal peritoneum about the head of the caecum. I could not very well reach the liver, but felt no nodules on it, and there were no enlarged glands. I anastomosed the ileum to the pelvic colon. The descending colon was much thickened, but not greatly dilated. During his recovery from the operation he began to cough, and physical signs of effusion appeared at the right base, and an exploring syringe discovered pus there. During this time he had moderate evening pyrexia, and rapidly lost flesh. He had no recurrence of the intestinal obstruction, but had some incontinence of faeces. On November 22nd, having withdrawn an exploring syringe barrel of pus from the chest, I endeavoured to evacuate the pus, but opened into a small shut-off space in the pleura, and could not get the exploring syringe through this into any collection of pus. He died the next day. It was not obvious at the operation why I did not open into the empyema, from which I had just withdrawn the pus; but the necropsy showed that at the exploration the needle had passed through a space of unaffected pleura which had been shut off by localized adhesions and a thin layer of collapsed lung, and into this space I unfortunately opened at the operation, and failed to reach the pus again by the exploring needle passed from it in various directions.

The necropsy also showed that there was extensive breaking down tuberculous disease of the base of the lung, on the side of the empyema, and tubercles were scattered throughout both lungs. In the abdomen were some breaking down nodules on the mesocolon of the transverse colon, and many nodules in the omentum, but no general tuberculosis of the peritoneum, nor any peritonitis, except that old adhesions were present around the anastomosis; and there was not as much as an ounce of fluid in the peritoneal cavity, and this was clear serum. The lumen of the iliac colon was so reduced that I could not pass my little finger through it. The enlargement of this portion of the iliac colon seemed to be due to great thickening of the coats, and the edge was well defined. Both the muscle coat and the mucous membrane were each one-third of an inch in thickness. The thickened mucous membrane formed an irregular raised edge at its junction with the healthy bowel, and here the mucous membrane was puckered. The surface was not ulcerated but smooth, but not as smooth as healthy mucous membrane. There

were no enlarged glands. Professor Walker Hall investigated the nature of the lesion, and has been good enough to allow me to publish his report, which is as follows:

The mass consists of carcinomatous tissues.
The submucous, muscular, and subperitoneal tissues are invaded by glandular cells arranged atypically.
In places the infiltration is so marked that individual bundles of muscle fibres are separated by masses of cancer cells.
The cells themselves show colloid degeneration, and this process is general throughout the specimen.
There is evidence of spread by lymphatic vessels.

BLOODLESS OPERATION FOR HAEMORRHOIDS AND PROLAPSUS ANI.

BY MAJOR F. McKELVEY BELL, M.D.,
SURGEON TO —— CANADIAN STATIONARY HOSPITAL, FRANCE, AND ST. LUKE'S GENERAL HOSPITAL, OTTAWA, CANADA.

THE operation here described is intended for cases in which four or more large piles occur or in the milder grades of prolapsus ani. In other words, it may be used in any case in which Whitehead's operation is indicated, but has the advantages of being almost bloodless and less liable to complications.

The usual preparation is given by mild laxatives and a light diet for two days previous to operation, ol. ricini ʒ j and no supper the evening before, and two to three simple enemata—that is, sufficient to clean the colon—in the morning. The instruments required are one large slightly-curved clamp, two Hagedorn needles, one semi-curved needle, one pair of scissors curved on the flat, tissue forceps, thermo-cautery, and No. 4 silk for suture.

Operation.—After dilatation of the sphincter, a long silk suture is passed through at the junction of the skin and mucous membrane in the mid-perineal line (Fig. 1). This suture is to be left untied and used as a retractor (1), two similar sutures are inserted on either side of the anus (2 and 3), so that when traction is made upon all three the extruded mucous membrane is converted into a triangle.

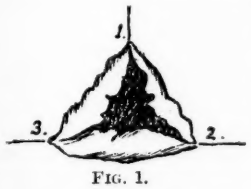

FIG. 1.

Each side of the triangle is to be dealt with individually. The portion between 1 and 2 is clamped in order to mark the area for excision. This area is limited externally by the junction of the skin and mucous membrane, and extends internally to within one-eighth inch of the required depth. On removal of the clamp a bluish furrow will be seen, the inner and outer borders of which mark the area for suture.

The two Hagedorn needles are now threaded at either end of a continuous silk suture. The first stitch, which

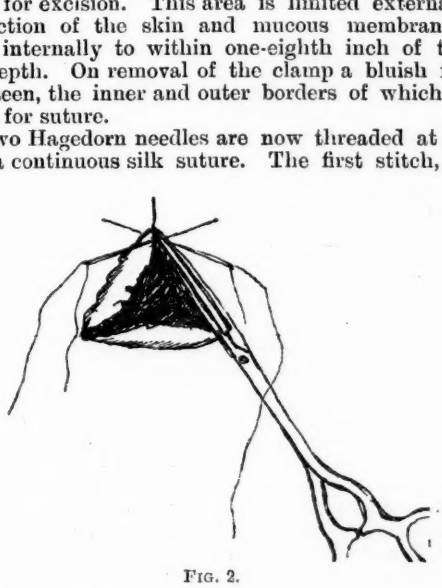
FIG. 2.

may be inserted before removal of the clamp, is placed at the apex of the triangle, and is tied at the centre of the thread. The clamp being removed the two needles are passed through from opposite sides at the same point—a cobbler's stitch (Fig. 2). Each stitch is pulled taut but not tied. The suture is continued in this manner at ¼ in. intervals until the lower end of this side of the triangle is reached, where it is tied. With the scissors the redundant tissue is now clipped away at a distance of one-sixteenth of an inch from the line of suture (Fig. 3). The narrow ridge thus left is lightly touched with the thermo-cautery. The other two sides of the triangle are similarly treated, and the traction sutures are removed.

FIG. 3.

A suppository containing 1 grain ext. opii is inserted, and the usual rubber tube (⅝ by 3 in.), wound with iodoform gauze and well anointed with vaseline, is introduced (Fig. 4). This tube is left *in situ* until the morning of the fifth day after operation. The patient is kept on fluids for four days, and the bowels are constipated with pil. opii gr. 1 to 2 daily. At the beginning of the fifth day 1 oz. of castor oil is given by the mouth, and after four hours 6 oz. of warm olive oil is injected through the tube, which is then gently removed.

FIG. 4.

In a series of twenty-one cases this operation has given satisfactory results.

I am indebted to Sergt.-Major H. E. Law (W.O.), C.A.M.C., for the drawings illustrating this article.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

A CASE OF PUERPERAL SEPTICAEMIA TREATED BY INTRAVENOUS INJECTION OF EUSOL.

To the perusal of the article, "On a case of septicaemia treated by intravenous injection of eusol," by Drs. Lorrain Smith, James Ritchie, and Theodore Rettie, which was published in this JOURNAL on November 13th, 1915, we feel indebted for the successful treatment of the following case:

Mrs. C. H., aged 19 years, a primipara, was delivered of a male child on January 21st, 1916. The labour was very difficult, and was terminated by forceps under chloroform. Owing to the large size of the child, which weighed 10 lb., there was considerable laceration of the vagina and perineum.

On the third day after confinement the temperature was found to be 101°, while the lochia were very offensive.

The stitches were removed, the raw surfaces painted with pure phenol, and the vagina and uterus were douched with mercury biniodide solution (1 in 2,000), and aspirin in 10-grain doses every three hours administered.

On the evening of the same day the patient had a very severe rigor, lasting for two hours. Next morning the temperature had risen to 103.4° and the pulse was 132. The same local treatment was carried out, and next morning 10 c.cm. of polyvalent serum were injected; this dose was repeated the following day. Notwithstanding this the patient's condition became steadily worse.

On January 27th 120 c.cm. of eusol in normal saline, warmed to 37° C., were injected into the right median basilic vein, under local anaesthesia (1 per cent. solution of quinine-urea hydrochloride). Mr. A. G. Francis, Surgeon to the Hull Royal Infirmary, performed the operation.

Several hours later the patient became very restless, and complained of great pain in the back. A hypodermic injection of morphine ¼ grain, with atropine $\frac{1}{150}$ grain, hyoscine $\frac{1}{150}$ grain, and strychnine $\frac{1}{30}$ grain was accordingly given; sleep supervened in a few minutes and continued for several hours. Next morning the pain had entirely disappeared and the temperature had fallen 1.5°. Two days later it registered 99.4°, and reached normal on February 1st. The pulse, though still rapid (over 100), had greatly improved in quality. Previously of extremely low tension, it had now the character which an eminent French clinician so graphically described as *bien frappé*.

The local treatment adopted subsequent to that already described consisted in twice daily douching the vagina

with 1 per cent. solution of lysol and insufflating iodoform. Improvement was steadily maintained, the patient being able to leave her bed four weeks after the date of confinement.

A. T. BRAND, M.D.
Driffield, East Yorks. J. R. KEITH, M.D.

CRANIAL TUMOUR (? DERMOID BY IMPLANTATION.)

PRIVATE R. T., No. 9441, was stunned by the explosion of a shell on April 29th, 1915. A blunt body must have struck the skull, for the skin was slightly wounded; it healed in a few days, but a tumour rose up within five days, and early in May was about the size of a medium-sized orange. Though he had a sense of pressure inside his head, he does not think the tumour itself had pulsation in it at that time. About June a skiagram was taken, and a fracture of the skull was seen at the edge of the tumour. Operation was declined.

I saw the patient in October, 1915, and at first thought the swelling was a meningocele which had become shut off by healing of the fracture. It was round and fluctuating and free from pulsation or expansion on blowing efforts. It had previously been diagnosed as hernia cerebri by another surgeon. At this time I did not think it wise to operate.

The patient was sent to Colchester. A radiograph taken there plainly showed the old fracture of the skull at the edge of the tumour. Having concluded that the cyst must now be shut off from the brain I decided to operate, and on November 29th an incision was made and the whole cyst was shelled out clean. It had no brain connexion. It peeled off from the bare bone in the centre over the bregma. The fracture lay an inch away. It had upward raised edges, so that some diffused pressure must have been made elsewhere by the shell explosion, or the body which was driven by it against the skull. On opening the cyst, hair and sebaceous matter was seen, and on the wall were a few white projections but no teeth.

The question then arose whether the cyst was a mere coincidence, or whether skin had been driven in by the shell and caused a tumour by implantation.

The officer in charge of the laboratory at Colchester reported as follows:

> Section shows a simple dermoid cyst lined by about three layers of squamous epithelium, on the surface of which is shown sebaceous secretion. There are large numbers of sebaceous glands. It is impossible to say from a section whether it is a traumatic inclusion dermoid or of congenital formation. The site, of course, would give you much information towards settling the point. If it was in the region of one of the sutures it would almost certainly be a congenital one.—WM. L. MACKARELL, Captain R.A.M.C., O/C Laboratory.

As no tumour was noticed before the injury, and as the cyst was on a suture, it must be concluded that an embryo dermoid must have been incited to grow by the stimulus of the injury.

Up to date—January 20th, 1916—there is no sign of recurrence.

W. LEDINGHAM CHRISTIE, M.D., F.R.C.S.Eng.,
Temporary Lieutenant R.A.M.C.

Reports of Societies.

TREATMENT OF GUNSHOT WOUNDS.

IN the discussion at the Harveian Society of London which followed the address by Sir BERKELEY MOYNIHAN, published in the JOURNAL of March 4th, several speakers spoke of the risk of relighting up infection by secondary operations. The opinion seemed to be that such operations should be deferred as long as possible. Mr. CLAYTON-GREENE said that he was not satisfied as to the proper treatment of a small wound discharging pus with a foreign body at the bottom of it. The danger of interference was that of opening up fresh avenues of infection. He thought exploration should be deferred until the streptococcus had been got rid of by prophylactic vaccines and by Bier's method of cupping. Mr. DONALD ARMOUR thought that the ill effects of reopening wounds were associated specially with bone, in connexion with which there was a real danger of reawakening old suppuration. He had been much encouraged by the results following the use of magnesium sulphate and glycerine in infected cases. Mr. D'ARCY POWER, speaking of dense infiltrating scars the result of prolonged suppuration following extensive laceration of the soft tissues, expressed the opinion that graduated movements by the patient and massage rendered the tissue much more supple, and made excision of the scar undesirable—at least during the earlier periods.

Mr. DUNCAN FITZWILLIAMS and Mr. A. EDMUNDS spoke of the results witnessed in the Mediterranean among the wounded from Gallipoli. Mr. Fitzwilliams said that the hypertonic salt solution had been much used at Malta, but that antiseptics increased the rate of healing. Mr. Edmunds said that chloramine was one of the most valuable additions to the surgeon's kit, but as the supply was limited he had kept it for a difficult class of mouth cases—those in which the palate was badly damaged. He agreed as to the value of the hypochlorite solution if thoroughly applied to all parts of the wound.

Mr. ALEXANDER FLEMING said that when he went out to France he found the clinical appearance of the wounds totally different from anything he had seen in civil practice, and that bacteriologically the difference was just as marked. The wounds in general resembled the foul-smelling appendix abscesses of civil life. The infection was primarily faecal, and the microbes in the early stages were those normally found in the intestine of men and animals—namely, *B. aërogenes capsulatus*, *Streptococcus*, *B. proteus*, *B. coli*, and a number of spore-bearing putrefactive anaërobic bacilli (to which latter the foul smell was due); all of these were found in faeces. In order to trace the source of infection cultures were made from portions of the soldier's clothing, selecting parts remote from the wound in order to avoid contamination from the wound discharge. These were incubated aërobically and anaërobically, and samples showed out of twelve:

10 containing *B. aërogenes capsulatus*.
5 containing *Streptococcus*.
4 containing *B. tetani*.
2 containing *Staphylococcus albus*.

The examinations were carried out in November, 1914, when there was much tetanus among the wounded. These experiments showed that the soldier's clothing was the source of the wound infection. Wound infection might be divided into three stages: (1) A gross infection with anaërobic spore-bearing bacilli, producing a foul-smelling sanious discharge, due to the action of the bacilli on the blood clot in the wound; (2) the anaërobic bacilli disappear, and the discharge becomes more purulent, but not as yet like the so-called "laudable pus"; (3) infection with pyogenic cocci. In explanation of the importance of (3) he related the following experiment: Human faeces were planted in blood clot and incubated anaërobically for twenty-four hours. A loopful of this culture was transferred to a second tube of blood clot and incubated like the first, and so on for ten days, in this way reproducing to some extent the wound infection. He found that the early cultures, in addition to *streptococcus*, contained many *B. aërogenes capsulatus*, *B. coli* and putrefactive organisms, and that these became gradually fewer, until after ten days all had almost entirely disappeared except the *streptococcus* and some Gram-positive bacilli called "wisp bacilli," similar to those found in wounds; the tenth subculture had practically the same flora as an infected wound ten days old. While wounds may become serious in the early stages from infection with tetanus, gas gangrene, and septicaemia, the streptococcal infection of the later stages was by far the most serious, for all the septicaemias were due to it. He described two distinct types infecting these wounds: (1) the *Strep. faecalis*, relatively non-virulent, (2) *Strep. pyogenes;* in about one-third of the cases he had found a third—an anaërobic streptococcus—which had caused a rapidly fatal septicaemia in the patient from whose blood it had been isolated in pure culture. His observations on the use of pure carbolic acid, and iodine solution in alcohol, for the primary sterilization of wounds, led him to conclude that the results were no better than had the applications not been used. The later infections of war wounds he considered not essentially different from those seen in civil practice; in both, the streptococcus and staphylococcus played the most important part, the former being the more potent factor of the two. Since 1903 all forms of sepsis had been treated at St. Mary's Hospital with

vaccines, and in a very large number of cases the benefit seen had been obviously due to the vaccines. They increased the antibacterial substances, and he thought that inoculation with small doses of streptococcus vaccine or of "antisepsis" vaccine (a mixture of streptococcus and staphylococcus) would be beneficial in the later stages of the wounds, and that two or three inoculations preceding a secondary operation might prevent the recrudescence of the sepsis.

The PRESIDENT expressed his agreement with Sir Berkeley Moynihan's scepticism as to vaccines. He thought that their value when a patient was already suffering from a poison produced by organisms remained to be proved. Mr. CLAYTON-GREENE observed that it was difficult to form an opinion as to the real value of vaccines, because there were no controls. He had recently had two cases of streptococcic infection which recovered comparatively quickly after the use of vaccines; he did not think either of them would have recovered otherwise; but autogenous, not polyvalent, vaccines should be used.

Reviews.

MODERN BONESETTING FOR THE MEDICAL PROFESSION.

MR. ROMER has written an interesting little book of a very practical kind on a subject which should be of much interest to the medical profession. From time immemorial the bonesetter has flourished in our midst; he has scored his successes, and for many and obvious reasons his failures have not received adequate publicity. The failures are due often to the fact that the bonesetter is insufficiently trained to distinguish various forms of arthritis in their earlier stages from joints which are merely fixed by adhesions. The successes are equally the result of a want of experience on the part of the surgeon, which should enable him to distinguish the uncomplicated presence of adhesions. It is rather disappointing in studying Mr. Romer's book—which is entitled *Modern Bonesetting for the Medical Profession*[1]—not to find emphasized the fundamental principles which should guide the surgeon in dealing with the doubtful case. Details are given as to how adhesions should be broken, but the value of the book would have been increased had we been told which is the type of joint to be broken down, what are its essential symptoms, which condition we should approach warily and which boldly.

The author describes very graphically the different movements to be employed in the various joints, and makes the interesting observation that in many instances it is not expedient to put an articulation through its full range of movement. This is not usually taught nor often practised, and in those cases in which symptoms recur an incomplete manipulation is generally blamed. The after-treatment by massage and passive movements is very wisely insisted on. Mr. Romer states that rapidity in execution of the movements gives rise to far less after-pain than if the adhesions are broken down by slow and deliberate stretching. An anaesthetic is recommended in order that complete muscular relaxation should be secured.

The book can be recommended as a very instructive and sane presentment of a subject which has a special interest at this time.

TROPICAL DISEASE.

Rural Sanitation in the Tropics,[2] by Dr. MALCOLM WATSON, will be read with interest by sanitarians everywhere. It is a record of what has been done to make the tropics healthy since mosquitos were incriminated in the spread of important diseases such as malaria and yellow fever. The work is dedicated to Sir Ronald Ross, who has laboured so vigorously in this branch of medicine, and whose original work in establishing the part played by the *Anopheles* in the transmission of malaria may be said to be directly responsible for the pages under discussion now. After an introductory chapter, two chapters are devoted to British Malaya. Here the able work done by Dr. Watson himself is described—how he dealt with the flat land near the coast, and with the hilly land further in. The importance of definitely recognizing the species of mosquito that is carrying the malaria of any given place is well brought out. This is essential if the measures are to be successful. Chapter IV deals with quinine prophylaxis in Italy; V with malaria in India; and VI with Hong Kong and the Philippines. Nine chapters are devoted to Panama, one to British Guiana, one to Barbados. There is an epilogue, and its opening sentence may be quoted, since it puts the matter in the proverbial nutshell. "The problem of sanitation in the tropics, like most problems in the tropics and elsewhere, is primarily one of ways and means." To translate this into other words: if plenty of money can be commanded it is possible to do anything, even to the moving of mountains. Granted, however, a plentiful supply of funds, there still remains the question of their proper application, and it is in the description of this that the book will prove so valuable to future workers. The gigantic experiments at Panama are well described. Here the money was ready, but even so the whole undertaking might have failed if Colonel Gorgas had not been given a free hand to expend the funds in the proper way. Dr. Watson brings this out clearly in his book. No engineering skill alone could have succeeded without the help of the sanitarian, and one may also say without a sanitarian of genius. But, after all, the health of rubber estates and small areas in the tropics is as important—at least to the directors and shareholders—as mammoth undertakings like the Panama Canal. How they may secure this by judicious expenditure will be found in the pages of Dr. Watson's work. There is only one word of warning needed, and that is that means which may be quite adequate for one place in the tropics may not equally apply to others, and a somewhat more prolonged visit than Dr. Watson paid to some of the parts he studied is requisite to get a proper understanding of the local conditions which prevail there throughout the year. The book is in many ways a personal record of what Dr. Watson saw—a journal, in fact—and it may confidently be predicted that all who read it will enjoy it as much as the reviewer did. It is a pioneer work, excellently written, and should prove of the greatest value to future sanitarians in all parts of the tropics. Dr. Watson's practical work in Malaya is well known, and his book will undoubtedly add to his reputation.

Part III (Ixodidae) of *Ticks: a Monograph of the Ixodoidea*[3] appeared last October (1915). This deals with *Haemaphysalis*, and is by Professor G. H. F. NUTTALL and Mr. CECIL WARBURTON. It is concerned with 50 species and varieties of the genus. All the descriptions are original; they include three new species and three new varieties, aberrant forms and numerous hitherto undescribed stages of known species. The work is beautifully illustrated by black-and-white sketches, and by uncoloured and coloured plates. The value of this monograph has been already indicated in previous reviews, and all that is necessary to add now is that the present part maintains the high excellence of those that have gone before, and forms the standard work on the subject in the English language. A first bibliography was published in 1911, but as many papers have appeared dealing with ticks and their relation to disease since that date, a second had become necessary; this contains 462 titles, and should prove most useful to workers on the subject.

THE PLAGUE OF NOISE.

IN a little book recently published Dr. DAN MCKENZIE has come forward as a prophet of the Silences, in a more practical sense than Carlyle.[4] He is deeply impressed by the evils of noise, to which attention has frequently been called in the BRITISH MEDICAL JOURNAL, and he has written in the hope of abating a nuisance which may conceivably

[1] *Modern Bonesetting for the Medical Profession.* By F. Romer, M.R.C.S.Eng., L.R.C.P.Lond. London: W. Heinemann. 1915. (Demy 8vo, pp. 88; 20 figures. 5s. net.)

[2] *Rural Sanitation in the Tropics: Being Notes and Observations in the Malay Archipelago, Panama, and Other Lands.* By M. Watson, M.D., C.M., D.P.H. London: J. Murray. 1915. (Med. 8vo, pp. 336; 56 figures. 12s. net.)

[3] *Ticks: a Monograph of the Ixodoidea.* By G. H. F. Nuttall, F.R.S., and C. Warburton. Part III, *Ixodidae.* The genus *Haemaphysalis*, October, 1915. Cambridge: At the University Press. 1915. (Sup. roy. 8vo, pp. 349-550; 13 plates, 141 figures. 12s. net.)

[4] *The City of Din. A Tirade against Noise.* By Dan McKenzie, M.D.Glasg., Fellow of the Royal College of Surgeons, Edinburgh. London: Adlard and Son, Bartholomew Press. 1916.

grow into a danger to the higher development of human faculty. The world, like Prospero's isle, is full of noises, of which it certainly cannot be said that they give delight and hurt not. The din in which dwellers in large cities live would shatter the strongest nerves if a certain tolerance were not bred by habituation. Dr. McKenzie aptly defines noise as painful sound, and he gives a lucid and accurate description of its evil effects on the organ of hearing, and on the brain and the general system. We fear there is much truth in his pronouncement that as modern civilization progresses the noisier it tends to become, because the invention of machinery plays so large a part in the evolution of industrial enterprise. Dr. McKenzie has not so far been able to detect any signs indicative of damage to the ear itself from the noises of everyday life; but to an auditory apparatus made delicate by catarrh or other morbid condition the din of street traffic is distinctly harmful. He rightly holds the motor horn in special abhorrence, and he curses it with a wealth of invective that might satisfy even Sir Henry Morris. But, although we agree with him that the horn is greatly abused, we cannot admit that it is "quite unnecessary." It should, however, be used with something of the remorse and mitigation which Malvolio entreated Sir Toby Belch to apply to his voice, and its hootings might be tuned to a uniform standard of tone and pitch. As far back as in 1910 Mr. John Burns gave a sort of promise that this should be done, but, as far as we are aware, nothing more has been heard of the matter.

Another cause of suffering to sensitive persons is the railway whistle. At the annual meeting of the British Medical Association in Birmingham in 1890, Dr. Thomas Barr, of Glasgow, expressed the conviction that the ear was injuriously affected by the shrillness of these whistles, and a resolution was passed asking that something should be done to abate the evil. But the railway companies turned a conveniently deaf ear to the appeal. More recently Professor Vittorio Grassi of Pisa suggested that the sound of all whistles, bells, horns, and other instruments used for signalling purposes on railway lines and by all kinds of vehicles, works, and so forth, should be less loud and piercing; and that stringent regulations should be made by public authorities prohibiting or limiting unnecessary and untimely noises, especially those of high pitch, which are the most hurtful to the ear and brain. Dr. McKenzie condemns the railway whistle as wholeheartedly as he denounces the motor horn; "in these days of electric signalling," he says, "the locomotive whistle is nothing short of an anachronism." It is significant that the motorist now finds a groan more useful than a shriek.

Among the other noises contributing to the general din is the loud music which nowadays makes conversation in places of public resort impossible. Théophile Gautier described music as the most expensive of noises; had he lived at the present day he might have been tempted to say that it is also one of the most irritating to sensitive ears.

The very worst effects of noise are seen in the present war, in which

> Bellona storms
> With battering engines

with a violence she has never displayed before. Dr. McKenzie refers to the possibility of making guns silent, but he offers no solution of the problem. Indeed, we gather that for the present he is doubtful as to the expediency of mitigating the noises of war. Even if we discovered a way of saving our men from the effects of noise, it is not in the least likely that the Germans would dispense with the use of so potent an instrument of "frightfulness."

Dr. McKenzie hints at the possible development of a protective deafness in the men of the future, the result of which would be that their sensitive brains would be spared "the paralysing impacts upon them of the heavy blows of artificial sound." This is a somewhat dismal speculation, but we are encouraged by his admission that a good deal has been done in recent years in the way of abatement of the noise nuisance.• Smooth road surfaces have deadened the crushing and jarring sounds of heavy traffic, and police regulations have reduced the volume and variety of street noises. The substitution of electricity and hydraulic power for steam has considerably lessened the deafening sounds of machinery. Much remains to be done, but Dr. McKenzie ends his homily on a strong note of hope of final victory over noise; this will, he says, "come all the sooner if public opinion can be educated to regard noise as an evil to be condemned and reformed out of existence with all possible dispatch." His book, in which the lightness of the style makes the solid sense of the matter easy of digestion even to a casual reader, will be a powerful help in the furtherance of the cause which he has at heart.

TREATMENT OF TYPHOID FEVER BY DESSY'S VACCINE.

IN his thesis on the treatment of enteric fever with the vaccine prepared by Dr. Silvio Dessy, Dr. MAGLIONE gives a brief account of previous work in this field.[5] Dessy's vaccine was first used in 1903; it contains over forty strains of *Bacillus typhosus*, grown for forty-eight hours on alkaline agar, and emulsified in a small quantity of normal saline. The bacteria are precipitated from this by adding a small amount of agglutinating serum of high potency, from a patient with enteric fever, and keeping at 40° C. for twenty-four hours. The clear supernatant fluid is poured off, the agglutinated and precipitated bacteria are dried by rapid centrifugalization, and then suspended in physiological saline, weighed, and treated with an equal volume of 1 per cent. caustic soda solution to dissolve them while they are shaken for three hours. Treated thus the microbes swell up into a mucilaginous mass like white of egg. This mass is diluted with distilled water saturated with carbon dioxide, so that each cubic centimetre of it contains one milligram of the bacteria. For the most part the bodies of the bacteria have gone into solution in the vaccine thus prepared. This vaccine is sent out in bulbs containing 1 c.cm.; before administration by subcutaneous or intravenous injection it is to be diluted with five volumes of normal saline. The dose for subcutaneous administration is not mentioned; for intravenous injection the first dose is one-fifth of a bulb, and later doses, given at intervals of twenty-four or forty-eight hours, may be increased by one-tenth of a c.cm. of the undiluted vaccine. These intravenous injections are generally followed by a rigor fifteen or twenty minutes later, and subsequently by an enlargement of the spleen. Maglione states that the vaccine should not be employed in patients with intestinal haemorrhage or myocarditis, chronic alcoholism, or tuberculosis. He gives details of 131 patients with enteric fever treated in the Italian Hospital at Buenos Aires with Dessy's vaccine between 1913 and 1915. From one to eight injections were given in different cases, the average being about four. Eight of the patients died—a mortality of 6.1 per cent. In two-thirds of the cases the treatment lasted for from three to twelve days. A chart is given which shows in a striking way the tendency of this treatment to cut short the fever. Between 1905 and 1911 the classical methods of treatment were used in 1,050 cases of enteric, with 159 deaths (mortality 14.2 per cent.), and an average duration of thirty-one days. With Dessy's treatment the fever lasted as long as thirty days in only one instance, and averaged under a fortnight. Dr. Maglione strongly recommends the treatment of the disease by the intravenous injection of this vaccine, and notes that it generally causes the fever to end by crisis. Its employment does not exclude symptomatic treatment. Without doubt he makes out a good case for further trial of the vaccine.

NOTES ON BOOKS.

DR. ESPINE WARD'S *Beri-beri: Its Etiology, Symptoms, and Treatment*,[6] represents the thesis he presented for the degree of M.D. of the Queen's University of Belfast. After a general survey of the disease, a detailed clinical account is given of 32 cases which occurred in the prisons at Freetown, Sierra Leone. This is followed by a synopsis of the cases. The very interesting fact is brought out that, of the prisoners who developed beri-beri in the gaols, all had been feeding on rice and rice alone, and not on the ordinary diet they were believed to be having, and to Dr. Ward is due the credit of having discovered this fact. The

[5] *Tratamiento de la Fiebre Tifoidea por la Vacuna Dessy.* By Roberto Maglione. A Thesis for the M.D. Degree at the National University, Buenos Aires. Buenos Aires: "La Semana Medica," Imp. de Obras de E. Spinelli. 1915. (S. roy. 8vo, pp. 168.)

[6] *Beri-beri: Its Etiology, Symptoms, and Treatment; with a Detailed Clinical Account of Thirty-two Cases occurring in Sierra Leone.* By Espine Ward, M.D., B.Ch. Belfast: Mayne, Boyd, and Son, Ltd., and Wm. Mullan and Son. 1915. (Demy 8vo, pp. 84.)

ordinary diet of the prisoners in those gaols is a full one, and it would certainly be difficult to see how beri-beri could break out when such a diet was being used. Careful observations, however, revealed the fact that an alteration had been introduced at the beri-beri prisoners' own request, these individuals having asked for rice alone. This fact may well explain many other outbreaks of this disease which have so far puzzled students of its epidemiology. The synopsis of the cases shows careful and accurate work, and the thesis well deserves the honour the university conferred upon it.

Professor A. G. WOODMAN'S book on *Food Analysis*[7] is the outcome of his experience as a teacher at the Massachusetts Institute of Technology. Certain typical foods are selected to illustrate the more important methods by which the special problems of analysis may be attacked; the book is therefore one for the student of analytical chemistry rather than for the practising chemist. Especial attention has been devoted to the chapters on the analysis of fats and oils, carbohydrates, and alcoholic beverages. The author writes with clearness and prolixity; he deals with many articles of food that are commoner in America than Great Britain. Naturally the text owes much to previous writers on the subject, and the author expresses a special debt of gratitude to the publications of the United States Bureau of Chemistry. Numerous references to the literature are given, and numerous statistical tables. The book appears to serve its purpose admirably, and may be recommended to the attention of those for whom it is designed.

A book on botany[8] for students and teachers engaged in study for the Senior Cambridge Local Examinations in the upper forms of secondary schools has recently been written by Mr. THODAY. It assumes no previous knowledge of the subject, and is both lucidly written and well illustrated. It is meant to be used in conjunction with nature-study and work in the practical laboratory. The author clearly has had a considerable experience of the teaching of elementary botany, and his book may safely be placed in the hands of those for whom it has been designed.

MEDICINAL AND DIETETIC PREPARATIONS.

Esprit de Liége.

ALTHOUGH for many years much of the "Eau de Cologne" sold in this country has been manufactured here, and a formula for it—under the name "Spiritus Coloniensis"—is given in the *British Pharmaceutical Codex*, the various brands actually made in Cologne continued to have a large sale before the war. The name "Eau de Cologne" has now ceased to be appropriate, and there appears also to be a strong objection on the part of many to naming a useful article for the toilet and sick-room after a German town. An excellent spirit of the same kind is now put forward under the name "Esprit de Liége," and a sample has recently been submitted to us by the manufacturers, the Peace Pillow Company (17, Manchester Avenue, London, E.C.); it is a perfume similar to that which it is intended to replace, but not identical with it, very sweet and refreshing, and leaving no trace of unpleasant residual odour when evaporated. It will be an excellent perfumed spirit for the sick-room, and will no doubt achieve popularity.

YELLOW FEVER.

A SERIES of reports on questions connected with the investigation of non-malarial fevers in West Africa, instituted by the Yellow Fever Commission[1] recently appointed by the Colonial Office, have been published as supplements of the Yellow Fever Bureau *Bulletin*. They form two bulky volumes, of which the first has 7 plates, 9 plans and maps, and 128 charts, the total number of pages being 352. Volume II has 12 plates, 1 map, 107 charts, and contains 400 pages. It is thus evident that an enormous mass of material has been collected, and Sir James Kingston Fowler in his preface states that "whilst accepting no responsibility for the views expressed in these reports, the Commission are of opinion that the results of these researches, conducted, as many have been, in the face of very great difficulties, should be placed on record, not only to commemorate the painstaking efforts of the investigators concerned, but also because they may prove useful as a basis for criticism and discussion, and may thus assist in the solution of the problems which still confront those whose administrative duties bring them into contact with yellow fever."

The recent history of yellow fever in West Africa is interesting. The late Sir Rubert Boyce, it will be remembered, some years ago propounded the theory that yellow fever was universally endemic all over the West Coast of Africa. If he had said that it prevailed endemically in certain areas, probably no one would have seriously disagreed with him, but the assertion of its universality was severely criticized. In many ways, however, these present reports are a result of Boyce's views. They bring out the fact—a fact, however, not seriously disputed before—that epidemics of yellow fever do from time to time occur in West Africa, the origin of which cannot be traced to importation from other parts of the world. The disease can, then, be spoken of as being endemic in West Africa, or at least in parts of it.

Yet another point brought out is the difficulty of diagnosing yellow fever, not only clinically, but even in some instances pathologically after death. The parasite of yellow fever is still unknown; there is therefore no single definite test by which it can be established that any individual case is or is not one of yellow fever. Mild atypical cases are notoriously difficult of diagnosis, and as those who thus suffer do not die, it is not possible to be absolutely certain the attack was one of yellow fever. This is a point in connexion with which much work remains to be done. It is, of course, right to state that Seidelin, one of the Commissioners' investigators, claims that he has discovered the parasite of yellow fever, and the open-minded attitude the Commission takes is shown by the fact that papers for and against that view appear side by side in the second volume of these reports. The destructive criticism of Seidelin's views contained in a recent paper by Wenyon and Low finds support in papers by David Thomson and Lieutenant-Colonel Harvey, and it seems probable that the suggestion that the paraplasma is the parasite of yellow fever will not survive. In that case much of the matter in vol. ii will have no permanent value, as, for instance, the chapters on experimental yellow fever in laboratory animals, reports on the transmission of *Paraplasma flavigenum*, and the report on some histological lesions observed in laboratory animals infected with yellow fever. Apart from these criticisms, many of the other reports are very valuable, and show evidence of careful and painstaking work. Lieutenant-Colonel Statham's conclusions on page 386 should be carefully noted by future investigators of the disease in West Africa. The pendulum has swung to the other side, and, as he states, fever with transient albuminuria is now considered highly suspicious of yellow fever. Albuminuria, however, is common not only in some of the types of malaria, but also equally in many other conditions, so that too much stress must not be laid on the symptom. Dr. Wyler's and Dr. Leonard's reports give a good idea of the yellow fever cases observed in Lagos during 1913 and the beginning of 1914. No one who has seen yellow fever in the West Indies and South America can read these reports without being convinced of the correctness of the diagnosis. Some of the cases which showed malarial parasites in the blood—notably, for example, Case 26, p. 270—might be questioned, but about the majority there is not the slightest doubt. The only point lacking in the reports of the cases is the absence of careful blood counts per cubic millimetre and differentially. It is a pity that so good a chance was lost.

The volumes as a whole, then, form a valuable contribution to our knowledge of yellow fever, and they will no doubt give rise to criticism and discussion. One word of warning to those who administer the West Coast colonies —*Stegomyia fasciata*, the carrier of yellow fever, seems to be as prevalent as ever in many parts of the coast. Now is the time to act against it. To wait until another epidemic appears will be too late. To be forewarned is to be forearmed; remove the intermediary and there will be no further trouble with the disease it carries. The examples of Cuba, Panama, Colon, and Rio point the way.

[7] *Food Analysis: Typical Methods and the Interpretation of Results.* By A. G. Woodman. New York; McGraw-Hill Book Co., Inc. London: Hill Publishing Co., Ltd. 1915. (Demy 8vo, pp. 520; 108 figures. 12s. 6d. net.)

[8] *Botany: A Textbook for Senior Students.* By D. Thoday, M.A.Cantab. Cambridge: The University Press. 1915. (Demy 8vo, pp. 490; 205 figures. 5s. 6d. net.)

[1] Yellow Fever Bureau *Bulletin* (Liverpool School of Tropical Medicine). Supplement, volume I and volume II. Yellow Fever Commission (West Africa). Reports on Questions Connected with the Investigation of Non-malarial Fevers in West Africa. Liverpool: University Press. (Price, volumes I and II, 25s. net; for subscribers to the *Bulletin*, 21s. net.)

ROYAL MEDICAL BENEVOLENT FUND.

AT the last meeting of the Committee, held on February 8th, twenty cases were considered, and £170 10s. voted to fifteen of the applicants. The following is a summary of the cases relieved:

Widow, aged 73, of M.D.Dubl. who practised in London and died in 1876. After her husband's death she settled in Brussels and took in paying guests, and did well and was able to save. At the outbreak of war her house and contents were taken over by the enemy, and all her savings were in Belgian stocks, which she cannot realize. Has been living with friends, but this cannot continue. Voted £9 in six monthly instalments.

Widow, aged 52, of M.R.C.S.Eng. who practised in Wolverton and died in 1912. Was left fairly well off, but brother-in-law, who had her affairs in hand, has disappeared and taken all with him. Has tried to earn a little by taking in boarders, but not successfully. One son, aged 17 years, who only earns 5s. a week. At present in great financial trouble. Voted £12.

Daughter, aged 72, of M.R.C.S.Eng. who practised in London and died in 1872. Applicant managed to earn a living as a governess until a few years ago, when she became totally deaf, and suffers with rheumatism. Only income a pension of £25 from the Governesses' Benevolent Institution. Voted £12 in twelve instalments.

Daughter, aged 32, of M.R.C.S.Eng. who practised at Wolverhampton and died in 1884. Applicant has had continuous bad health for years. Only able to work a few hours a day, and earns about 6s. per week by teaching typewriting and bookkeeping. Relieved eight times, £58. Voted £12 in twelve instalments.

Widow, aged 35, of M.R.C.S.Eng. who practised at Swansea and Liverpool and died in 1914. Applicant is suffering from paralysis of the right side, and is quite unable to do anything. Has one child aged 7 years, whom the Guild are going to see if they can assist with respect to her education. Applicant lives with her mother, who is not well off. Relieved once, £12. Voted £12 in twelve instalments.

Daughter, aged 59, of M.R.C.S.Eng. who practised at Battle and died in 1873. Applicant suffers from chronic rheumatism and defective eyesight; she is quite unable to work, and is dependent on a sister. Relieved thirty-two times, £254. Voted £12 in twelve instalments.

Daughter, aged 59, of M.R.C.S.Eng. who practised at Box and died in 1894. Applicant lives with two sisters, and all have indifferent health. Receives a little help from friends and from another charity. Relieved eight times, £126. Voted £18 in twelve instalments.

Widow, aged 69, of M.R.C.S.Eng. who practised in London and died in 1893. Applicant's health is very bad, and she has recently had an accident which left her lame. Has a house which she lets, but cannot get the rent from the tenant, so is in temporary difficulties. Relieved once, £10. Voted £12 in twelve instalments.

Widow, aged 68, of M.D.St. Andrews who practised at Kidderminster and died in 1884. Before the war she managed fairly well by taking in lodgers, but lately has lost them all, as they have joined the army, and recently has been ill in bed. Relieved once, £10. Voted £12 in twelve instalments.

Daughter, aged 41, of M.R.C.S.Eng. who practised at Scarborough and died in 1879. Applicant makes a little by occasional nursing, but has not been successful of late. Relieved eleven times, £107. Voted £10 in two instalments.

Widow, aged 67, of M.D.Lond. who practised at Hoxton and died in 1897. Was left quite unprovided for at her husband's death, with one daughter, who worked as a milliner, but is now without a post. Makes a little by letting her house furnished in the summer, but not sufficient to enable her to manage. Relieved five times, £60. Voted £10 in two instalments.

Widow, aged 66, of M.R.C.S.Eng. who practised in various places and died in 1903. Applicant has two children, both married, and only able to help very little. She is too old to do anything herself in consequence of indifferent health. Relieved twelve times, £142. Voted £12 in twelve instalments.

Daughter, aged 54, of F.R.C.S.Eng. who practised in Bedfordshire and died in 1890. Applicant was left entirely unprovided for, and the state of her health prevents her from taking any permanent work. Relieved ten times, £76. Voted £12 in twelve instalments.

Widow, aged 58, of L.R.C.S.Edin. who practised at Fulham and died in 1910. Applicant endeavours to earn a living by taking boarders, but has not been very successful, and her health has been very indifferent of late. Relieved three times, £25. Voted £12 in twelve instalments.

Subscriptions may be sent to the honorary treasurer, Dr. Samuel West, 11, Chandos Street, Cavendish Square, London, W.

The Royal Medical Benevolent Fund Guild appeals for gifts of secondhand clothing, boots and shoes in good condition, also household linen. The gifts should be sent to the Secretary, Royal Medical Benevolent Fund Guild, 43, Bolsover Street, W.

A SCHEME for the establishment of a school of dental surgery, to be closely allied to the medical school of Columbia University, is under consideration.

GERMAN PRISON CAMPS.

MUCH has been heard of the brutality with which the Germans treat the prisoners of war, especially the British, who have fallen into their hands. The evidence as to this in the early days of the war, when the enemy thought he was carrying all before him and could do as he liked, is overwhelming. Things have changed to a certain extent now that chastened hopes have dictated prudence. Moreover, though the lot of the prisoner can never be a happy one, there have all along been differences in the conditions in the various camps, due partly to the personality of the officers in charge, partly to the difficulty of accommodating and providing for masses of men suddenly brought together and kept under guard in places unsuited for the purpose. It may be interesting, therefore, to give the experiences of some medical prisoners. They may be compared with those of Mr. L. J. Austin, Dr. A. R. Elliott, and Captains C. T. Edmunds and E. S. B. Hamilton, and Lieutenant W. S. Danks, R.A.M.C., published in the JOURNAL of January 23rd, 1915, p. 165. Readers may also be reminded of the interesting account of an outbreak of typhus fever in a German prison camp given in the BRITISH MEDICAL JOURNAL of November 20th, 1915, p. 737, by Major P. C. T. Davy, R.A.M.C., and Captain A. J. Brown, R.A.M.C.(S.R.). They were captured on August 26th and 27th, 1914, and were kept in various prisons with other British officers, without being employed in their medical capacity, till February 11th, 1915, when they were sent to Gardelegen.

Dr. Etienne Breton, a French army medical officer, who was taken prisoner at Maubeuge, was first sent to an officers' camp at Gutersloh; some time afterwards at his own request he was transferred to a soldiers' camp at Münster in Westphalia.[1] There he found that for nearly 12,000 men, comprising about 400 English, 500 Belgians, a score of Russians, and more than 10,000 French, there were only four doctors—a Russian, a Belgian, and two German. Two days after Breton's arrival the Russian and the Belgian were sent away, and the Germans being of little use, he asked for assistance, and was assigned two French doctors who remained with him till they were all liberated in July, 1915. The German doctors were replaced by two others who were very devoted and kind to the prisoners. Breton makes graceful acknowledgement of the help he received from "the thoroughly well instructed infirmarians of the R.A.M.C.," one of whom, Sergeant Walter Tindall, was for eight months the greatly appreciated dentist of the whole camp. The sick who were able to get up were paraded every morning. Cases of fever were sent to hospital. The other cases seen were chiefly bronchitis and laryngitis, neuralgia, stomach and bowel troubles, rheumatic pains due to insufficient bedding (often consisting of wood shavings or straw), cachectic oedema without albumin, skin diseases caused by vermin, urticaria, pruritus, boils due to bad pork, ham, and sausages, and the pies of liver and lung which formed the staple of their diet. Herpes zoster was very common, and the men, especially the Russians, suffered much from severe chilblains. There was a good deal of neurasthenia, especially among prisoners from the occupied regions who never received either letters or parcels from their families. After a time Breton was able to procure for this class some additions to their diet, and he organized a fund which further helped them. Although at first only a few stock medicines were served out almost at haphazard, later the doctors could order "at their discretion" aspirin, antipyrin, pyramidon, quinine, morphine, tincture of opium, calomel, rhubarb, ipecacuanha, Carlsbad salts, and other drugs. For the parasites they had camphorated oil and a pomade with a basis of powdered sulphur and balsam of tolu (10 per cent.), which was very effective. For the dressing of wounds sublimate was freely supplied, oxygenated water and tincture of iodine more sparingly. Antiseptic gauze was readily got, cotton-wool not so easily. There was a service of massage and movement cures carried out by a British orderly, which gave excellent results. There were special blocks for tuberculosis, for fever, and for wounded men, each accommodating 25 to 30 patients. In these blocks the mattresses, instead of being on the ground, were on wooden bedsteads, and the wards were better lighted and ventilated; they were also

[1] *Paris médical*. December 11th, 1915.

heated. Every ten days a batch of twelve patients with incipient tuberculosis was sent to a sanatorium with 400 to 500 beds, where they were better nourished and had better conditions generally than in the camps. All the prisoners were vaccinated against small-pox, typhoid, and cholera. For typhoid Pfeiffer's vaccine was used. For cholera a serum having no special name was employed. The German doctors could give no account of its composition, effects, or results.

In the *Journal of the Royal Army Medical Corps* for November, 1915, Captain W. K. Beaman relates his experiences. He was taken prisoner with several other medical officers at Landrecies on August 26th, 1914. A few days later they were sent to Germany. At various places on the way they were insulted and threatened, and they were kept very short of food. "The German Red Cross give no food to prisoners, wounded or otherwise. At times it is shown to them and then withdrawn, with kindly remarks that 'it's not fit for swine.'" On September 4th the party reached Torgau, where they found some sixty British and hundreds of French officers. They were housed in soldiers' barrack-rooms. Each had a bed consisting of a straw mattress on boards supported on an iron frame. The bedding consisted of two blankets, one sheet, pillow-slip, and blanket-bag, which served the purpose of a second sheet. Food was bad, but extras, such as jam, ham, and sausage, could be bought at the canteen. The latrines were very dirty and were cleaned out only when absolutely necessary. There was a good system of shower-baths with hot and cold water, and a daily bath could be got. For exercise there was at first only a small yard, but later an outer court was opened where football, rounders, and tennis could be played. In November all British officers were transferred to Burg. Equal numbers of Russians and English were placed in each room, and no two British officers were allowed to sleep side by side. They were lodged in converted gunsheds and stores; some rooms were fairly good, others very bad. Discipline was strict and oppressive. All the German officers were very hostile to the British, but much less so to the Russians and the few French who were there. The latrines were deep trenches, very dirty, and quite insufficient. Only one bath a week was allowed. The food was generally eatable, but the quantity was insufficient.

On December 6th Captain Beaman with thirty-six others left Burg for Halle. In the old factory in which they were placed dirt was the prevailing feature and lice were fairly plentiful. British, French, Belgian, and Russian officers were all lodged in large, ill-ventilated dormitories. The latrine was a deep trench, very dirty, insufficient, and cleaned out only as a last resource. The food was cheap but very bad. Some extras such as sausage, ham, jam, and margarine, could be bought at the canteen. A daily bath could be had. Discipline was not so strict as at Burg, and the German officers were quite agreeable and polite. During December and part of January, 1915, all foodstuffs were taken from the prisoners' parcels for the Red Cross, which gave no receipts. In February Captain Beaman was transferred to Quedlinburg, a soldiers' camp, where he was nominally in charge of the English prisoners. There were fourteen other medical officers—twelve French and two Russians, who were housed in small wooden huts. The 10,000 prisoners in the camp—Russian, French, and British—were housed in wooden huts which were not rain-proof. Two blankets a man and mattresses stuffed with shavings, four for six men, were issued. Food was scanty and unappetizing, at times uneatable. Without parcels from home the men would almost have starved. The feeding improved somewhat when the administration took over the messing from contractors. Medical arrangements were satisfactory. There were ample dressings, but occasionally a shortage of drugs. The old hospital left much to be desired, but the new one was good. An isolation hospital was ready in case of an epidemic. The general health of the camp was fairly good, though tuberculosis in every form was rife; pneumonia and bronchitis were common. All this was due to overcrowding and deficient food. No isolation of tuberculous patients was carried out. Practically no clothing was provided by the German administration, and it was very difficult to obtain clothes sent out from home for the British prisoners. Captain Beaman says that the British owe a great debt of gratitude to the American Ambassador at Berlin, who, in the face of much obstruction and subterfuge, had done much to relieve the sufferings of the prisoners. "Much yet remains to be done, and it must always be remembered that an inspection of a camp is a set piece, much forethought being expended by the authorities as to the staging."

Dr. François Léonetti paints a darker picture of his captivity.[2] Taken prisoner at the battle of Macquigny (Aisne) on August 29th, 1914, he had a narrow escape from the revolver of a German officer, who said the inhabitants of a village occupied by the victorious troops had poisoned the wells. His life was saved by the intervention of a German doctor. After working in the Hôtel-Dieu at Guise till January, 1915, he was sent to Gastrow in Mecklenburg, a camp where there were 12,000 Russian, 4,000 French, 2,000 Belgians, and 1,000 British prisoners. All were in tents without sufficient protection from cold and wet, and were suffering from hunger and infested by vermin. The French soldiers had been allowed to keep their kit, but the Russians had been compelled to exchange their boots for bad wooden shoes, and cloaks and body linen had been taken from the British. The sanitary conditions were of the very worst kind and lice swarmed on clothes, blankets, and mattresses. No precautions were taken against disease. Accommodation for the sick was very inadequate, and the doctors had only morphine, aspirin, and tincture of iodine at their disposal. Typhus fever raged in the camp for five months. There were hundreds of wounded, who could not be treated owing to the want of dressings. Everything was lacking—linen, bedding, drugs, and suitable nourishment. The medical service at first consisted of two German students, but a few days after Léonetti's arrival there were seven French doctors, and some weeks later four others, two French and two British, were sent. Gradually things improved, and in March the only serious ground of complaint was the insufficient food. At that time parcels began to arrive more regularly from France and England, and the contents were distributed with admirable comradeship. The British, who had been more exposed to the cold as their clothes had been taken from them, suffered a good deal from nephritis, which, however, was of mild type. All the prisoners suffered much from frostbite. Antityphoid inoculation with Pfeiffer's serum was carried out, and as the men were vaccinated they were sent away to other places and put to agricultural or factory work. Léonetti estimates that 60,000 men passed through the hands of the doctors. He gives an amusing account of the care with which the camp was prepared for a visit from the Spanish Ambassador. His Excellency was taken round and invited to admire the cleanliness of the huts, the arrangements for disinfection, and so forth. The only thing that had been forgotten was to show samples of the food. One of the prisoners boldly placed himself before the ambassador, showed him the uneatable bread, and told him of the insufficiency of the diet. The German colonel said the bread had been tampered with. Red Cross visits and official inspections all had the same result. The Germans are, says Léonetti, past masters in this kind of stage management. At the beginning of April he was sent to Langensalza, a watering place in Thuringia, where an epidemic of typhus had been raging in the camp since January. Of fifteen doctors who had gone there in March, nine were already attacked. There was scarcely any accommodation for the patients, who in one week numbered 3,000, with only five doctors to attend them. There were no medicines. Men sickening with the disease lay on the floor in corridors during the day, and were sent back at night to their quarters where they mixed with their still healthy comrades. There was at first no attempt at disinfection, and the German doctors refused to admit to hospital cases of typhus in which there was no well-defined eruption. Even after stoves were set up, clothing was given back at haphazard and so imperfectly treated that it served as a means of distributing vermin. The German doctors never dared to go near the patients, and French doctors had to be appealed to. A specialist, Dr. Rheberg, was sent from Berlin, to whose courage and devotion a warm tribute is paid. The epidemic wore itself out after nearly 95 per cent. of the prisoners had been attacked; probably some mild cases

[2] Souvenirs de captivité. *Thèse de Paris*, 1915.

escaped observation. In the early part of May Léonetti was sent with six other doctors to Niederzwheren near Cassel in Westphalia, where an epidemic of typhus had been raging since February, but the deaths were put down to influenza, gastric troubles, and bronchitis. The authorities were indifferent, the general in command saying frankly that he was making war in his own way, and that a dead prisoner meant one ration less. When, however, the epidemic at the end of March spread to the German Guards, to the garrison of Cassel, and finally to the town, the gravity of the situation was recognized. Foreign doctors were sent for and by the end of June there were eighty-eight in the camp. The conditions were very bad. There was no hygienic installation, the stench was dreadful, nationalities were mixed up, and there was the usual want of food. Under the pretence of disinfection the wretched mattresses and blankets were taken away and the men had to lie on bare boards. On Léonetti's arrival there were 6,000 sick. He admits that praiseworthy efforts were then being made to supply appropriate shelter and drugs and milk in sufficient quantity. Isolation was provided, disinfecting stoves were set up, and means were adopted for destroying vermin. But as the result of what he calls the criminal carelessness shown at the outset there were up to July 14th 1,700 deaths among French, British, and Belgian prisoners, and 900 among the Russians, a total of 2,600. Not all these deaths, however, were due to typhus. Léonetti, who returned to France in July, says that few camps escaped typhus. At Erfurt, where the epidemic was promptly suppressed, there were only 600 cases in a population of 20,000. At Cassel and Langensalza thirty doctors were attacked by the epidemic, of whom nine died. Léonetti says that but for the Allied doctors the state of the prisoners in Germany would have been more deplorable. Thanks to the unceasing efforts of the committee of the Red Cross, improvements on certain points were made, but much still remained to be done.

There is a mass of corroborative evidence from various quarters as to the unhappy condition of prisoners of war in German camps, but we have chosen to limit our selection to medical witnesses. It is only fair to state that correspondence between our Foreign Office and Mr. Gerard, the United States Ambassador at Berlin, shows that there has been a great improvement in certain camps since May, 1915. Writing of Ruhleben on November 1st, Mr. Gerard says that a satisfactory system of drainage was completed in September, and more washhouses had been provided. Notwithstanding his repeated protests, however, the camp lazaret had never been satisfactory, though decided efforts had been made during October to improve it, including the provision of hot and cold baths. He submits figures of winter clothing supplied, including overcoats and underclothing, showing that about 60 per cent. of the camp have been so accommodated, and also other statistics tending to prove that the canteens have been ably and economically administered. Mr. Gerard states that when he visited Ingoldstadt in Bavaria on January 15th, there were some 4,000 prisoners, among them 11 British, in the camp. Food was about the same as that often described. The midday meal on the day of his visit consisted of tripe and potatoes. The cooking was done by Frenchmen. The British all had sufficient clothes and two blankets each. Baths (hot and cold shower) were allowed practically whenever desired, and the men were allowed to get hot water for washing clothes from the bath-house or kitchen. The British prisoners had no particular complaints. The barrack where they slept was rather crowded, the double-deck system being in use. The barrack floors were dirt only, or rather mud, with a board strip. The commandant promised to see that the roofs, which leaked in places, were repaired. The British prisoners worked on the railway, etc., and also in the large military hospital. They stated they preferred work of this kind to doing nothing. They were allowed to play football. There was a camp library and a theatre where weekly performances were given. The relations between the camp officers and the prisoners seemed excellent. There was a well furnished canteen where reasonable prices were charged. The men received letters and parcels promptly, but were charged 5 pfennigs for each parcel. This charge was made, the commandant told Mr. Gerard, to create a fund for the prisoners who received neither gifts nor money.

We have had the opportunity of seeing a report by the Hon. Ella Scarlett-Synge, M.D., of a visit she was allowed to make to camps at Wittenberg, Giessen, Göttingen, and Ruhleben. She formed the opinion that the sanitary and other conditions in these places was satisfactory. Complaints were few, and the prisoners were contented with their lot, except the English, who sometimes found fault—unreasonably, it is suggested — with the food; they grumbled at the state in which their parcels reached them—this, again, is said to be due to faulty packing—and, unlike other nationalities, would not work even for pay. Theatrical performances, musical performances, and other entertainments were given, and opportunities of education in languages, art, and other subjects were offered. With all these advantages, accompanied by every care for the needs of the body and also of the soul, it would seem to be a piece of good fortune for a young man to be a prisoner in Germany. But some doubt assails us that the picture is a trifle too rosy. We do not suggest that the lady is a victim of that antinational bias which is so curious a feature in the mentality of a certain section of our people. We are rather inclined to believe that she has been, at least in some degree, misled by the German skill in stage management, of which the other medical witnesses speak. She proposes that an English commission should be sent to Germany to report on all camps, while a corresponding German commission could come to this country with the same object. Frankly, we do not think the British public is prepared to accept the report of a commission of representatives of a people who meet charges of atrocities testified to by countless witnesses, and accepted as fully proved by British, French, and Belgian commissions of the greatest weight, by belated denial.

Typhus fever is a sure index of sanitary inefficiency and underfeeding, and the fact that outbreaks of the disease have occurred in most if not all German prison camps is not denied. Quite probably the sufferings of the prisoners are in many instances rather due to the breakdown of the German organization than to deliberate malice, and as has been said there is evidence that efforts are being made, in some camps at least, to improve matters. Reports by members of the staff of the American Embassy at Berlin, published early in March, indicate that conditions at the prisoners of war camps at Limburg, Giessen, Darmstadt, Mannheim, and Heidelberg are now satisfactory. The camp at Mannheim, where there are sixty British prisoners, is described as a "good example of the specially and scientifically constructed camps, and general conditions are of the best." Much of this improvement is due to the courage and persistency of the American Embassy, and, according to Mr. Ian Malcolm, there is now hope that even the Russian prisoners who have suffered so severely from typhus will be treated with more consideration. In a letter published in the *Times* a short time ago he stated that the Swedish Red Cross Society had called a conference in Stockholm last December of representatives of Russia, Germany, Austria, and Hungary. The delegates adopted unanimously a series of recommendations, which, it is hoped, the respective Governments will accept. The gross mismanagement of the prison camps in Germany during at least the first year of war will always remain as evidence of the inefficiency of German sanitary administration, and, we regret to add, a blot upon the competence and courage of the medical profession of that country.

PROFESSOR BEREZNEGOWSKY (*Wratsebnaia Gazetta*, No. 22-23) relates some cases of gunshot wounds observed by him, which, in his opinion, could not be caused by any other but explosive bullets. The presence of a great number of loose fragments and particles of bones and metals, as seen by the *x* rays, the extension of the laceration to the soft parts, and the black edge around fresh wounds, all afforded evidence that the latter were not caused by an ordinary massive bullet producing a "humane wound," but by one which explodes within the body into a number of small fragments. If the claims of the officers are true, that some bullets explode while in the air, there ought to be cases in which small multiple fragments are found in the body without tracing any entrance or exit wound. Such a case has been observed by the author, in which the clinical picture corresponded with the history related by the injured. The observations made by the author were in the districts of the north-west front from Bzura to Mitawa at different times.

British Medical Journal.

SATURDAY, MARCH 18TH, 1916.

ENROLMENT: AN URGENT NATIONAL NEED.

THE Central Medical War Committee is organizing meetings at four centres in England and Wales, to be held in the course of next week. The centres chosen as likely to be most convenient to the largest number are Leeds (March 21st), London (March 22nd), Birmingham (March 23rd), and Bristol (March 24th). The purpose of the meetings is to ensure the success of the enrolment scheme, and two members from each local Medical War Committee will be invited to attend. It is essential that, in the interests of all, every medical man of military age throughout the country, whether fit or unfit; whether employed by a public authority or in private practice in any capacity whatever; whether he can be spared from the district in which he practises or not; whether his personal difficulties are great or small, should enrol—that is to say, should sign the form of application for a commission, whereby he expresses his willingness to serve his country if at any time in the future the need for his services should arise. His application will be retained by the Central Committee, and when the enrolment of every man is complete the selection of those who can most easily be spared to take commissions in the R.A.M.C. can be carried out with absolute fairness to the profession and to the community. Not all, probably not half, the men who have signed the enrolment form will be required for service; but, under the enrolment scheme, no man will be placed in the difficult position of deciding for himself when it is his duty to go.

It has been urged by many critics of the work of the Central Medical War Committee that the supply of medical men to the army has been ample; that occasional local shortages are due merely to bad organization, or to lack of regard to the economical use of officers already commissioned; and that further depletion of doctors in civil life may lead to serious danger to the community. To these arguments we reply that however ample the supply may have been in the past, wastage is always considerable and is certain to increase. How can it be otherwise when the country has armies in the field not only in northern France but in the Mediterranean and in Mesopotamia, where the troops have to encounter risks of tropical and subtropical diseases? We reply also that, under the present organization of the medical department, the number of medical officers employed is less than the recognized normal establishment for armies of the present size; that organization may be defective, but it has achieved remarkable success in Flanders and France, is constantly being improved as experience increases, and cannot be changed fundamentally at a moment's notice; that economies are already being effected and will increase as time goes on; and, finally, that no shortage of doctors in civil practice is visible at present comparable in the slightest degree to what appears to be the case with some of our armies abroad.

To those who still doubt the necessity for the enrolment scheme of the Central Medical War Committee we recommend perusal of the report at p. 429 of the remarks made by several members, during the discussion in the House of Commons of the Army Estimates, with reference to the defects which persistent rumours assert have marked the arrangements for the treatment of the wounded in Mesopotamia. The extract Mr. Lambert read from a letter of a wounded officer as to the lot of the wounded during evacuation from the field to the base at Basra is disquieting, and the statement that two hundred wounded spent five or six days on a paddle steamer in the Tigris, "lying anyhow on the deck with only one medical officer and practically no medical equipment," is evidence of shortage. Mr. Long, who replied for the Government, admitted that the medical arrangements had been inadequate, that the Government of India had instituted a special inquiry on the spot, and that the War Office had found it necessary to send two Indian general hospitals complete, and the personnel of two more, a British stationary hospital of 400 beds, and a British general hospital of 1,040 beds, as well as during the last month 100 doctors to Mesopotamia. It is alleged in many letters received in this country that the scarcity of doctors in Mesopotamia is deplorable. We know that the Indian Medical Service has already lost heavily, and it seems certain that the War Office will require many more medical officers for Mesopotamia in addition to those who have already left, or are about to leave, this country. Supposing that the whole of the accusations of defective organization and lack of economy were true, do the critics suggest that this is a reason why "seriously wounded officers and men" should be "left for two or three days with no further attention to their injuries than the first field dressing"? Are lives to be lost while members of the medical profession are making up their minds whether their duty is here or abroad with the army? Is it right that Government departments and individuals should be trying to see how much of their medical services they can preserve to the civilian community rather than using the whole of their energies to see how much they can spare? Troubles such as are alleged to be occurring in Mesopotamia may happen at other points in the area of war. No man knows where the next difficulty may arise, or in what part of the globe it will be necessary to employ our military forces.

Without organization it is impossible for the medical profession to meet the call for officers. An integral part of that organization is that the national medical war committees of these islands shall be in a position to know exactly how many men are available and how they can be spared with the least disturbance of the interests of themselves and of the people at home. The letter from the chairman of the Barnet Local Medical War Committee shows the spirit in which the enrolment scheme should be accepted and how difficulties can be overcome by co-operation among the medical men of a district who are loyal to their country and each other. The haphazard methods of recruitment by individual offers can no longer be relied on; the men from whom further recruits must be drawn are the men whose difficulties are hard to overcome. To such men, who are at heart as anxious as others to serve their country in every way possible, the Central Medical War Committee, the Scottish Medical Service Emergency Committee, and the Irish Medical War Committee offer the only sound and fair method of meeting the exigencies of their position. And that method is Enrolment.

"SIGHT" FOR THE BLIND.

IN the columns of a well-known London daily there has appeared within the last few days an article of considerable length giving a rather elaborate account of certain experiments which seemed to promise the production of an apparatus of use as a "substitute for sight." Every one knows that the sun may be felt as well as seen, and probably not a few schoolboys have experienced the torment of being subjected to the effects of the focussing of a "burning-glass" upon their skins. Yet this is made the basis of a lengthy disquisition on a substitute for sight. It is proposed with every appearance of seriousness that a burning-glass should be placed in such a relation to the breast of the blind subject that the light focussed by the lens should fall accurately upon the skin; means would be taken by the interposition of screens to prevent burning, and by a process of training the subject would learn to see by means of the feel of the warm picture on his chest. The educational process would be carried out by placing a series of stencils on the chest which would leave slits, circles, and later on letters and signs exposed to the heat rays, and the sense of heat perception would be increased by its cultivation. All this sounds very much like the yarn that a schoolboy might write a very long way after Jules Verne, and one would have thought that a newspaper of importance would have secured the criticism of some physiologist before publishing such a rigmarole. But we notice that the article is under the heading "From German Sources," and the intention of the publication may be playful rather than serious. The excerpt begins "An article on optics of more than merely technical interest appears in the *Deutsche optische Wochenschrift*, and is quoted at considerable length by the *Tägliche Rundschau*. The writer is Professor L. Zehender, the Berlin eye specialist, who records an experiment which appears to have given rise to considerable discussion in German scientific circles." If this be a fair sample of the much vaunted *Ersatz*, the German palate that is satiated by new substitution products must be truly in a bad way.

The publication in a popular newspaper of this so-called "substitute for sight" may not do any particular harm, because, as has been said, it is so crude that the youngest would be able to understand how much and how little advantage the blind may expect to draw from it. Nor perhaps did any great harm come from the wide publication a few years ago of a plan for transmuting sight into sound out of which the blind were bidden to hope that they were one day to hear what others saw. It was based on a well-known scientific fact, but its practical application on even the simplest scale for the benefit of the blind presented insuperable difficulties, and even its promoters did not pretend that anything would come of it at present. So here again, for another reason, no great harm was done.

But it is otherwise with some of the schemes which from time to time are published in newspapers without any attempt at criticism. We are quite sure that the directors of these newspapers do not realize the effect such statements produce upon the blind themselves and upon the parents of blind children. Some of the schemes are dangerous to the man or the child who it is feared is going blind, and others make a cruel call upon the slender purses of the blind. The poor blind are very open to exploitation. Wonder healers and the like suck them dry of their poor earnings. Such an one as these had his "cures" vaunted in a newspaper not many months ago, but the child he "cured" is still blind and in a blind school; yet he has been allowed to trumpet abroad an offer of his services for the cure of soldiers blinded in the war. A few years ago a healer fleeced a maidservant of nearly fifteen pounds on the promise to grow her a new eye to fill the place of one she had lost; either he was less cunning than most of his kind or the girl more resolute than ordinary; by exception he got his deserts in a term of imprisonment. In the last few months we have known of two cases of children whose parents, refusing the care of the hospital physician, have resorted to quacks, with the result that these two children are now blind from the grossest effects of interstitial keratitis.

There is another evil, and that is the publication of garbled versions of genuine forms of medical treatment and operation. Recently an unfortunate man, whose sight was nearly lost from progressive disease, came from the other side of the world in search of a cure that he had heard of through an American newspaper. He brought with him a scrap of paper that he handled like a talisman of hope. It was a typical American "wonder paragraph," and the effect of its words, which he knew by heart, was too strong to allow him to depart as he came. He could not be brought to believe that the cure would be for him a danger. He must needs put his hope to the test. When seen again, as he was about to return to his distant home, he had lost his hope and had exchanged the remnant of his sight for two blind and painful eyes!

The Select Committee on Patent Medicines in its report expressed the conviction that "the proprietors of the better class of newspapers . . . would welcome a drastic suppression of suggestive or improper advertisements," but went on to say that this observation did not refer "to the advertisements of swindlers like Macaura, the 'eye quacks,' the 'deaf quacks,' the cancer-curers, the consumption-curers, the electric belt makers, the curers of rupture without operation, or 'fakirs' generally. As regards these classes, most newspaper proprietors do not regard it as incumbent upon them to test the good faith of secret remedy advertisers, any more than of advertisers of other goods, though a few of the leading papers exercise a very severe censorship upon advertisements of this kind also." If the need for such censorship is felt in regard to advertisements the need must be even greater in regard to the publication of editorial articles, for all but the most hopelessly unwary know that the statements in advertisements must commonly be taken with a grain of salt.

We may well ask the lay press to "Pity the poor blind."

SCHOOL BOOKS AND EYESIGHT.

A FURTHER report of the committee of the British Association for the Advancement of Science has been issued[1] giving an account of the investigations of the committee with the intent to obtain an objective measurement of the gloss of paper. Hitherto we have had to be content with a purely subjective test, and such a method had to be varied with each individual; a highly sensitive subject found the reflection of a very little gloss on the paper prevented comfortable reading and was trying to the eyes, while another of more lymphatic temperament found a gloss tolerable that would have driven the other crazy. The committee report that glossiness of paper depends mainly on specular reflection—that is, reflection as from polished metals; such reflection is apt to interfere with binocular vision. The ideal surface for books would

[1] London: British Association for the Advancement of Science 1915. (Price 4d.)

exhibit no specular reflection; all the reflected light would be scattered or diffuse reflection, equal in all directions and independent of the direction of the incident beam. In practice it is found that when the specular reflection does not exceed the diffuse reflection when the light is incident at 45 degrees, the paper is satisfactory; when the specular reaches 56 per cent. and the diffuse only 44 per cent., then there will be injurious glare, especially by artificial light. The apparatus devised by Mr. A. P. Trotter, one of the members of the committee, for the measurement of these qualities is ingenious in its simplicity. It is a clever adaptation of the principle underlying the photometer and the Wheatstone's bridge. A box about the size of an ordinary microscope case has a slot in the lid along which an electric lamp within the box can be slid. Just below the lamp is a screen which prevents the direct light of the lamp reaching the bottom of the box; at each end of the screen is a mirror set so as to reflect the light round the screen and illuminate one half of a hole cut in the bottom of the box. The paper to be tested is put beneath this hole. At the ends of the box, just clear of the mirrors, are two peep-holes fitted with double prisms; through these the hole in the bottom and the paper to be tested can be viewed. By shifting the lamp from end to end a balance of the specular and diffuse reflection from the paper can be obtained, and the relation read off by the position of the lamp in the slot. The reading from one peep-hole can be checked by that from the other; both should agree in their proportions. It would be of interest if the committee would put a series of papers to the test and issue a table of results. The earlier reports of this committee, which dealt particularly with the print of school books, are exerting their effects upon printers and publishers. The Cambridge University Press have recently issued a new *Textbook of Arithmetic*,[2] by the Head Master and Assistant Master of the Royal Naval College, Osborne. The publishers call attention to the large type used for this book, which conforms to the standards laid down in the typographical scale of the British Association report. They have further graded the type of the different parts of the book, using larger type for the earlier chapters which will be used by younger children than is necessary for the more advanced chapters for the use of the higher classes. There is, however, one defect in the get-up of the book: the paper is scarcely opaque enough to prevent the print of the reverse side of the page and also of the contiguous page from showing through to the page in use. This reduces the necessary contrast of print and paper, and renders the good type less legible. Also the surface of the paper is such that it will readily get dirty in the usage. We may commend the publishers for their attention to the typographical scale of the British Association, but the same report dealt with the density and surface of the paper. It is scarcely within our sphere to criticize the matter of a book on arithmetic, but we may call attention to a serious practical defect. A chapter is devoted to the subject of stocks and shares; it consists of two pages of explanation, two of examples, and two of set questions. The whole is inadequate, and if it be considered worth while to include a chapter on such a subject in a school-book—and we have no doubt it is—then it should be reasonably adequate. Maybe the inadequacy of this chapter is an indication of the general want of knowledge of professional classes on such matters, an ignorance which is to their serious disadvantage.

[2] *Arithmetic.* By C. Godfrey, M.V.O., M.A., and E. A. Price, B.A. Cambridge: The University Press. 1915. (Post 8vo. pp. 480. 4s. net.)

THE ADMINISTRATION OF ANAESTHETICS BY UNQUALIFIED PERSONS.

SOME undesirable procedures may be condoned by the exigencies of a great war; proof of the necessity must, however, be adduced before the profession can admit that the giving of anaesthetics should ever be committed to unqualified persons. We have seen a report of a matron being entrusted with this duty at a hospital when routine operations were being performed. No experienced person will deny that giving an anaesthetic involves grave responsibility, and patients may well expect that all professional work which involves grave risk will be carried out by registered medical practitioners. Even in the hands of the best trained anaesthetist patients die from or under an anaesthetic. Initial signs of complications are commonly very slight and can be gauged only by an experienced person, who, recognizing them, adopts remedial measures promptly. It is simple enough to train a nurse to pursue a routine method of anaesthetizing, and she, after a thousand or two administrations, will have mastered the technique, while incidentally she will believe she knows all about anaesthetics. But a professional man is aware that mastery of the technique is the least part of the outfit of a competent anaesthetist. He realizes that although comparatively few operations *per se* involve a risk to life, yet every time an anaesthetic is given life may be endangered. The uncontrollable factor—the patient—cannot be allowed for by a nurse, since even the accumulated science of the medical man may often be at fault. Is it, then, justifiable to permit a nurse or matron to give anaesthetics except in a sudden emergency? It is often urged that an experienced nurse can carry out instructions and give anaesthetics as well as a medical man, but if this contention is true for anaesthetics it may be held to be true also in other branches of medicine and surgery, and in pharmacy. In this way the door will be opened to every kind of unqualified practice. Since the induction of anaesthesia has now become a science as well as an art, ought a surgeon to salve his conscience by the excuse that although he permits a nurse to give his anaesthetics he keeps a watchful eye on her procedures? No man can do two things properly at one and the same time.

DEATH FROM PARATYPHOID FEVER.

FATAL cases of paratyphoid fever are sufficiently uncommon to be worthy of record. Seventeen such cases have been studied at a stationary hospital across the Channel, and the results have recently been recorded by Sir Bertrand Dawson and Dr. T. H. Whittington.[1] They remark that the clinical picture in these severe cases conforms very closely with that of typhoid fever, so that the diagnosis must be based on the laboratory findings. In thirteen instances rose spots were present; abdominal distension and the toxic "typhoid state," so-called, were often absent in these severe cases of paratyphoid fever. In four out of the seventeen patients the respiratory manifestations were prominent features; bronchopneumonia was present in two of these, lobar pneumonia at both bases in the third, and massive pneumonia with cavity formation from necrosis in the fourth. It has been shown that lobar pneumonia can be caused by typhoid and paratyphoid bacilli alone, although probably the pneumococcus is more often associated with them. So far as the circulatory system is concerned, the authors observe that a pulse slow in proportion to the temperature is one of the most characteristic features of paratyphoid, usually lying between 70 and 90. In severe cases, however, the pulse is rapid, and there is no other single sign so significant and prophetic, so long as the temperature is above 100° F. The blood pressure varies and is generally lowered, while the apex beat is difficult to palpate, a feature in keeping with the pale and flabby condition of the cardiac muscle sometimes found; endocarditis was not recorded once. The spleen was found enlarged *post mortem* in eight of the patients; in one it was but half the normal size, and in two it contained abscesses the size of hen's or pigeon's eggs. The small intestine was ulcerated in both the cases of paratyphoid A and in twelve out of fourteen cases of paratyphoid B; the large intestine was involved much

[1] *Quarterly Journ. Med.*, Oxford, 1916, ix, 98.

more severely than is usual in typhoid fever, the lymphoid nodules and Peyer's patches being inflamed or ulcerated from the caecum to the pelvic colon in ten of the instances of paratyphoid B. The appendix was a focus of mischief causing peritonitis in three patients, one a case of paratyphoid A; in two it was perforated, in the third intensely inflamed. There were five cases of peritonitis in the series; laparotomy was performed in four instances, two with perforation of the appendix, two with perforation of the intestine. None of these patients recovered, although, as the authors point out, the cases were constantly under the eyes of skilled observers and received the most competent surgical attention. It is pointed out that it is the internal conditions that are so unfavourable here; for one ulcer that has perforated there may be several more that have nearly perforated, and the patient's reactive power, both local and general, is down to vanishing point. Two of the patients died from intestinal haemorrhage, three from haemorrhage and toxaemia; the seventeen deaths represent a death-rate of rather over 4 per cent. in paratyphoid B, and under 1 per cent. for paratyphoid A. The authors conclude that there seems to be a tendency to pus formation in these cases; abscesses occurred twice each in connexion with the spleen, appendix, and lung, and once in the liver, while one of the pulmonary abscesses gave rise to empyema.

SIR GILBERT BLANE.

SOME time ago Dr. H. D. Rolleston, who is now a surgeon-general, R.N. (temporary), contributed to the *Journal of the Royal Naval Medical Service*[1] an account of James Lind, to whom beyond any one else we owe the abolition of scurvy among sailors. He has followed this up with a sketch of the career of Sir Gilbert Blane, who was born in Ayrshire in 1749, studied at Edinburgh, and graduated M.D. at Glasgow in 1778. He became personal medical attendant to Lord Holderness, a favourite at Court, and in this way was brought acquainted with Sir George Rodney, whom he accompanied in H.M.S. *Sandwich*, the flagship of the fleet sent at the end of 1779 to raise the siege of Gibraltar. Blane had no official position; nevertheless, during several engagements he was employed by the Admiral, in the absence of executive officers, to carry orders to the guns, and was slightly wounded. This led to his official appointment as physician to the fleet. On his return to England in 1781 he submitted to the Board of Admiralty a memorial pointing out the neglect of cleanliness, ventilation, and dryness in the ships, the need for a supply of lemon-juice to prevent and cure scurvy, the prevalence of intemperance, the inadequate provision for the care of the sick on board ship, the absence of proper bedding, the want of soap, and the desirability of a gratuitous supply to naval surgeons of medicines and other necessaries. Nothing, however, was done at the time. At the beginning of 1782 he again went to sea with Rodney, and from these experiences afloat he gathered the knowledge of naval medicine and hygiene which he embodied in his *Observations on the Diseases of Seamen* (1788). On his return to London in 1783 he was elected physician to St. Thomas's Hospital, an appointment which he held for twelve years. He had considerable success as a physician, but his reputation rests mainly on his work as a reformer of naval hygiene. From 1795 to 1802 he was a Commissioner of the Board of the Sick and Wounded Sailors, a position which gave him the opportunity and the power to enforce the reforms he had previously advocated. An Admiralty Order enjoining the use of lime-juice in the navy, which came into force in 1796, banished scurvy from the service. In the same year he induced the Admiralty to provide soap for the crews. In 1802, in association with Count Rumford, he recommended ventilation of the lower decks of convict ships by means of wind sails and air tubes, with the result that the incidence of infectious disease was diminished. Blane's demand that medicines should be supplied free to naval surgeons was conceded in 1804. About this time, too, the sick bay was transferred from the ill-ventilated forepart of the lower gun-deck to a position under the forecastle. These various reforms were followed by a remarkable improvement in the health of the navy. Whereas in 1782, out of 100,000 seamen and marines, the proportion admitted to hospital for sickness was 1 in 3.3, in 1813, with a complement of 140,000, the proportion of sick fell to 1 in 10.75. In 1809 Blane was sent to inquire into the prevalence of malaria and other diseases, which incapacitated more than two-thirds of our army in the unfortunate Walcheren expedition; his report led to the abandonment of the island. In 1825, in a letter to the directors of the East India Company, he expressed the conviction that cholera was spread by human intercourse, not by aërial influence, and a year before the great epidemic of 1832 he issued *A Warning and Admonition to the British Public on the Subject of Indian Cholera*, which was circulated in the seaports. His most important contributions to therapeutics were on the uses of pure alkalis and lime water in disorders of the bladder, stomach, and skin, and on the effects of large doses of potassium carbonate in gravel. Blane was ever zealous in his efforts to improve the professional attainments and position of naval surgeons; as a means to that end he founded the two gold medals which bear his name. Many honours came to him. He was a Fellow of the Royal Societies of London, Edinburgh, and Göttingen, and a corresponding member of the Imperial Academy of St. Petersburg and of the Institute of France. He was made a baronet in 1812. He held a number of Court appointments, among them that of physician to George IV and to William IV. Blane spent the last ten or twelve years of his life in retirement, and died in 1834. Sir Alexander Armstrong, afterwards Director-General of the Medical Department of the Admiralty, said of him that he might "justly be termed the Father of Naval Medical Science."

[1] Vol. i, 1915. A note on this paper appeared in the BRITISH MEDICAL JOURNAL of May 29th, 1915, p. 938.

COLERIDGIAN "AMENITIES OF DEBATE."

MR. STEPHEN COLERIDGE used to boast of his tender regard for the "amenities of debate," a regard which he has consistently shown by his studied insolence and offensiveness towards all who ventured to express disapproval of his methods of controversy. We had almost forgotten him and his campaign against experimental research, but it appears that, as Beatrice says of Benedick, he will still be talking, though nobody marks him. In the March number of the *Zoophilist*, the wilderness in which his voice cries desolately, he attacked Sir Edward Schäfer for a leaflet published by the Research Defence Society, in which the distinguished Edinburgh professor points out that progress in medicine and surgery cannot be made without the help of animal experiment, and shows the inconsistency of those who are opposed to the use of that method and yet do not object to the exploitation of animals for the needs and luxuries of mankind. From this clear, straightforward statement of fact Mr. Coleridge detaches two or three passages and comments on them in a manner which obscures the issue. When Sir Edward Schäfer invited him to publish the whole document, which is quite short, in the *Zoophilist* and there criticize it as freely as he liked, Mr. Coleridge at first replied that this was "quite unreasonable," but he has since undertaken to reproduce it; he may then accept the rest of Sir Edward Schäfer's invitation, but so far there is no argument, hardly even a meaning, in what he is pleased to call his "criticisms." He speaks of "the unhappy pamphlet," and "this unhappy professor," and says that Sir Edward Schäfer "would really be better employed in trundling a hoop than in writing this kind of pamphlet!" Heine in his cynical confessions says that in the rapture of his Hegelian dream he regarded all who did not acknowledge

his self-made godship as "unhappy" unbelievers. Mr Coleridge's manner of writing arouses a suspicion that he has come to hold a similar idea of himself. And this, unlike the poet, in all seriousness, for among the many gifts bestowed upon him in the cradle his fairy godmother left out humour. With an assumption of pity for which we are sure Sir Edward Schäfer will be duly grateful Mr. Coleridge says: "These professors, heaven help them, seem all to be blessed with the immature brains of babes and sucklings." We suppose this kind of stuff is accepted as argument by supporters of the National Antivivisection Society, or it would not be offered for their edification by their director and treasurer. But what a mentality it reveals in them and in him! And what right has he to complain of being "subjected to raucous bellowings of personal abuse"?

X-RAY PROTECTION.

WHEN the discussion on *x*-ray protection was resumed at the Röntgen Society's meeting on March 7th Dr. W. Harwood Nutt said that he was inclined to believe that the tired feeling of which *x*-ray workers complained was due not to ionization but to ozone, which, according to some qualitative tests, was liberated by *x* rays. Dr. G. B. Batten laid stress upon the danger of associating work with chemical substances, especially alkaline materials, with *x*-ray manipulation. He had noticed a dermatitis supervene in a case of ringworm which previously had been treated with picric acid. Major Wilson, Canadian Medical Corps, said that the ideas of British manufacturers with regard to protection were certainly below the standard deemed necessary with the heavy transformer outfits obtained from the United States and Canada. In the Canadian military hospitals the most complete rubber protection was insisted upon, and a layer of 8 lb. lead (if possible a double layer) was passed round the tube box. The president (Mr. J. H. Gardiner) announced that the authorities of the National Physical Laboratory had stated that they were prepared to examine any protective material submitted to them, and to give a certificate upon its absorption coefficient.

Medical Notes in Parliament.

A Year of War.

MR. TENNANT'S STATEMENT.

ON the Army Estimates, which were taken in the House of Commons on March 14th, the Under Secretary of State for War made his annual statement on the work of the department during the closing financial year. He dealt chiefly with administrative questions; the sums in the estimates were token votes of £1,000 each, but Mr. Tennant said that the vote was for four million men, and that the navy, army, and munition departments were together costing just over three millions a day.

Recruiting: Medical Examination.

After the first rush to the colours the rival claims of the munitions department and the general labour market caused the intake of recruits gradually to dwindle. As it was evident that special steps were needed, Lord Derby undertook his scheme, and though men came forward slowly at first the intake grew larger until it culminated in the attestation of one million recruits in four days. During the early stages of the war many men who desired to enlist concealed physical defects, but later there was a change. Under the group system some men had persuaded the doctors that they suffered from disabilities which were fanciful or imaginary, and had consequently been rejected. It had been necessary to tighten up the machinery and to make the conditions in regard to armlets more stringent. At a second medical examination a number of men had been found fit for general service. The medical standard had never been reduced; the efficiency of medical examination had been materially improved and the standard was now more strictly enforced; some men previously accepted for military service by medical practitioners had been rejected by the medical boards set up in each military area. The war was a war of attrition, especially of men, and it became evident that everything should be done by grading men and putting them into categories to save those medically fit from doing what might be called supplementary duties; the first-rate men were released for fighting, and the men put into the reserve were able to return to their homes and businesses.

Pensions.

In dealing with the subject of pensions Mr. Tennant denied the allegation that the army pensions authorities had given no pensions for tuberculosis, frost-bite, rheumatism, heart disease, and epilepsy. In 1,932 cases of tuberculous disease pensions had been granted, and in 1,208 cases pensions had been refused. Of cases of frost-bite, 306 had been admitted to pensions, and so far as was known none had been rejected. Of cases of rheumatism, 891 had been admitted to pensions at the full rate, of cases of heart disease 1,431, and of cases of epilepsy 210. Soldiers discharged for injuries or wounds, or sunstroke received in action or in performance of military duty, or for blindness caused by military service, or disease due directly or indirectly to war service either abroad or at home, were given pensions at the full rates. There remained the cases of men who were discharged on account of disease which had been aggravated by service. It would be improper to pension from public funds men whose illness was neither caused nor aggravated by service. It might be said that none of those men should have been in the army, but during the first rush of recruits to the colours it was not possible to ascertain in every case that there was no organic trouble. Men had concealed their ailments—some from the best motive because they wished to fight for their country, some from very different motives. Of sixty men who came before the Chelsea board on February 24th, having been discharged from the army after periods of service extending from seven months to more than a year, not one had undergone any military training or even drill. They were men who had determined to get into the army in order to obtain free hospital treatment. It had been the habit of the Chelsea board to grant pensions at rates ranging from 4s. 8d. to 7s. a week to disabled soldiers whose condition had been aggravated by military service. It had been decided to increase the grant to four-fifths of the full pension. Orders had been issued to the labour exchanges which it was hoped would result in providing employment for discharged soldiers and supplying in some degree the labour for which employers were crying out.

Prisoners.

Arrangements made among the hostile Governments were tending to render the conditions for combatant and civilian prisoners of war better. Arrangements for the transfer of sick and wounded to Switzerland had been made. The camps in the German empire and in Austria-Hungary were under the inspection of the United States Ambassador and Consular Service, but, though the conditions were distinctly better, the ration was still very stinted. Prisoners in the Balkans had been assembled in Philippopolis and American doctors put in medical charge, and negotiations were in progress for the exchange of British prisoners in Turkish hands.

The Army Medical Service.

Turning to the question of the health of the troops, Mr. Tennant read a message from the General Officer Commanding-in-Chief the British Expeditionary Force in France, in the course of which he said that the forces in France had been increased "from a couple of corps to a large army, but the provision made for their wellbeing, whether in sickness or health, has continued to be all that could be wished. The result of the strenuous labour devoted to increasing and maintaining this army is that all are in good health and in good heart, and confident of victory." The medical service had been almost perfected. The incidence of disease in France was low; there had been an entire absence of any epidemic, and thanks were owed to the many scientific men who, by their energy and action, particularly in the prevention of disease, had helped to bring this about; splendid work had been done by the Sanitary Committee, especially in Gallipoli, where tropical diseases had been counteracted and an outbreak of dysentery and diarrhœa

had caused very great anxiety. There was now no anxiety in relation to the troops either in Salonika or Egypt. At home large convalescent hospitals had been established; in the military hospitals men were being replaced by women, of whom 1,400 had already asked for general service. For that thanks were due to the Red Cross Society, and thanks were due also to between 5,000 and 6,000 women who had organized under Voluntary Aid Detachments.

The Medical War Committees.

"In order to obtain medical officers under conditions least harmful to the needs of the civil population and the great civil institutions, we have," Mr. Tennant said, "established a representative body of medical men in conjunction with the National Insurance Commissioners and the Local Government Board. This had done very valuable work." The National Insurance Commissioners had taken up the question of the early treatment of cases of tuberculosis removed from the army. The medical profession in general had come forward in the most admirable way to meet the needs of the State. Most successful measures had been taken against gas attacks.

France.

The medical services, said Mr. Tennant, had done a very great work, and he read a letter from Sir Frederick Treves as follows:

Those who are familiar with the medical dispositions in the South African war will find in this campaign an advance in the medical services so great and so wide extending as to amount to an actual revolution. Not only has the sick and wounded soldier never been so well cared for in any campaign as in the present, but it is difficult to suggest in what way his welfare could be further promoted.

Sir Frederick takes a couple of illustrations. He says:

We should note in the first instance such an advanced dressing station as that at Les Brebis. The place is a mining village well within range of the enemy's fire. Indeed, some twenty shells had fallen into the area on the morning of our visit. The hospital is a building which was used by the miners as an entertainment hall. This hall makes an excellent ward, provided with every necessary detail. Attached is a small, carefully equipped operation room, where operations of an urgent nature—such as the arrest of haemorrhage—could be carried out. Here also wounds may be cleansed and redressed, fractures more comfortably adjusted, and injections of anti-tetanic serum given. Close at hand were two dug-outs into which patients could be taken if the shelling threatened the building. The whole station was simple, efficient, and exactly equipped for its limited purpose. There was nothing lacking and yet nothing superfluous, and the feature of extreme mobility was kept prominently in mind.

Reference is made to clearing stations, and he alludes to one at Bailleul:

From a surgical point of view, these clearing stations represent the most important items in the general scheme for the treatment of the sick and wounded. They are as near the front as they can be placed; they are readily accessible from the advanced dressing stations; while they are in direct touch with the base either by a line of rail or by a good main road. The tents are well warmed by stoves and well lit by electric light, while the operating theatre is as well-found as any in a civil hospital of its size. The huts at Remy and the wards at Bailleul could compare with the wards of any good civil hospital in England.

To these clearing stations wounded men can be brought in a few hours, and it is needless to point out that in the severest gunshot wounds prompt attention is the main factor in the saving of life and limb. In many cases a man in need of a grave operation has found himself on the operating table within three or four hours of his being shot. We were told of instances in which operations upon the skull and the abdomen had been carried out within two and a half hours of the receipt of the wound. Such prompt attention could not be obtained by a wounded civilian in any rural district in England. The patient not only finds himself in an operating theatre equipped with the best and most recent appliances, but in the case of every one of these hospitals he finds himself in the hands of an operating surgeon of the first order. The value of such service cannot be exaggerated. At the same time the patient has the advantage of the regular and frequent visits of a consulting surgeon of European reputation. Moreover, the nursing in these stations is of the highest type, being carried out by the army nursing sisters.

It must be remembered that a great number (and often the greater number) of the patients arrive at night, and that, over and over again, operations are carried out the whole night through. It must be noted also that vast shell wounds require constant and elaborate dressing that absorbs much time and can only be carried out by the surgeon himself. At Lapugnoy, with its 376 beds, no less than 2,000 casualties were dealt with in one day. We found that at the clearing station at Bailleul the vast number of 61,000 sick and wounded had passed the hospital since it was opened, while the number of major operations reached to over 1,000.

In the hospitals we visited we found on all sides evidence that the sick and wounded soldier has the advantages of the latest advances in surgical science, the most modern equipment, and the most recent developments in bacteriological work.

Mr. Tennant added that he had himself seen the clearing stations of which Sir Frederick Treves spoke most highly, and had watched the ambulances full of wounded coming to them until he could watch them no longer—he was so deeply moved. These were the men who had answered the call of King and country, and were risking their lives every day in the great cause. Could the country be content that these men who sprang forward to answer the call should die in France and Flanders while every effort failed to induce others to perform their duty and join their comrades at the front? Those who were too tender with the difficulties which these men put forward should consider what effect expressions of sympathy with them would have upon the waverers, and the cost to the army and the public. A terrible responsibility rested upon them, because to encourage the waverer at home was to dishearten and bewilder the soldier at the front.

Discussion.

The discussion which followed turned partly upon air policy, partly upon the alleged mismanagement in Mesopotamia, and partly upon the question of pensions.

Mesopotamia.

Mr. Hobhouse, who followed, asked for more precise information, and complained that Mr. Tennant had not dealt with the Gallipoli campaign and the expedition to Mesopotamia. With regard to the latter, the news which had filtered through during the course of the last fortnight was calculated to cause very serious alarm as to the condition both of the besieged and the relieving forces on the Tigris, and nothing was known as to what was going on at Salonika. Colonel Lockwood also complained that there had been no reference to the Mesopotamia expedition, as to which the public mind was at present intensely anxious. Very disagreeable rumours had come home as regards the treatment and care of the wounded in that expedition. It was well known that the care and attention bestowed on the wounded in France was magnificent, but private information he had received was to the effect that there was want of care of the wounded in Mesopotamia. Admitting the difficulties of the shortage of doctors, of the climate, and other drawbacks, he believed that more might have been done, and that more foresight might have been shown for the care of the wounded there. The expedition was for some time under the charge of the Indian Government, but he believed that now both the expedition and the medical care were under the charge of the War Office. Mr. Tennant interposing said, "Not the medical care." Colonel Lockwood said that in that case he would not be in order in pursuing the subject, but he was desirous that it should be known that the public was anxious, and had good reason to be anxious, as to the way in which the wounded there were being looked after. Mr. G. Lambert also complained that the advance on Bagdad had not been carefully thought out, and read a letter from an officer, whom he described as one of the most gallant in the British army. He had been wounded on January 13th or 14th, and he wrote:

I must consider myself fortunate to have arrived at Basra, where some medical aid was available, without getting a septic wound. The lot of the badly wounded during the evacuation stage from the field to the base at Basra is anything but joy. The five or six days spent on the paddle steamer down the Tigris are not to be forgotten in a hurry—two hundred, or possibly more, lying anyhow on the deck, with only one medical officer and practically no medical equipment. However, I understand that proper hospital steamers are now being sent out there.

Mr. Tennant interposed with the remark that the matter was one for the Indian Government and not for the War Office, but Mr. Lambert retorted that the War Office or the Army Council had assented to the advance, and must therefore be held responsible for the deeds of the Indian Government. He asked that the country should know how the wounded were progressing to-day in Mesopotamia.

Pensions.

Mr. Jowett (Labour) moved that the State should accept the responsibility for the payment of pensions and allowances to all soldiers discharged from the army on account

of diseases contracted or developed during service with the colours, and, in the case of death, pensions and allowances to the dependants. He maintained that the concessions announced by Mr. Tennant were insufficient, and strongly urged that they should be made retrospective. The motion was seconded by Mr. Hodge and supported in all parts of the House.

The Financial Secretary to the War Office, in his reply, began by saying that with a system of universal service there would have been a more complete and more satisfactory medical examination. When a man had been taken into the army and passed out of it, the question arose, was he or was he not entitled to a pension under the regulations of the Royal Warrant? That warrant was the verbal expression of the pension policy of the Government; if that changed the warrant changed, and he hoped it would be changed. The Board of Chelsea Hospital had full and free discretion to interpret the Royal Warrant, and it rested with that Board to decide to what a man was entitled in any particular case. He hoped that arrangements in contemplation would enable some payments to be made to a man between the time at which he was discharged and that at which his pension first became due. The Chelsea Commissioners had been able to deal with cases of aggravation of disease under another article of a Royal Warrant which enabled a lower scale of pensions to be given. The number of cases of tubercle contracted abroad was 1,226; of these, 1,180 had been pensioned, and only 46 had been rejected. The supposed analogy of the Workmen's Compensation Act should not be pushed too far; compensation could not be given in all cases of injury incurred while the man was not on military duty; but no one could look on the halt, and the maimed, and the blind without resolving that, at whatever cost, the country should see that none of them ever felt want. They should be treated as heroes; but there were men who could not be treated in that way—men whose disease was due to their own fault could not be brought within the terms of the motion; but he agreed that the terms of the warrant were not wide enough, and it had been decided that where a man's disease had been aggravated by, though not wholly and directly due to service, an extended authority should be given to the Chelsea Commissioners to allow a pension up to 20s., and that concession would be retrospective, men whose claims had been rejected being authorized to resubmit them. The motion was negatived, but Mr. Tennant's appeal to go into committee was disregarded and the debate was resumed on the following day, when it was directed chiefly to the calling up of married men, which Lord Kitchener, in the House of Lords, had said would in any case have become necessary within a few weeks. The arrangements in Mesopotamia and the general organization of the Army Medical Service also came in for criticism.

Army Medical Organization.

Mr. R. McNeill thought that Sir Frederick Treves's opinion quoted by Mr. Tennant must have been formed after visiting a clearing station or hospital in a certain section of the line, where provision for surgery was particularly well up to date, otherwise he did not know how the conflict of testimony could be accounted for, for there were other authorities hardly less eminent than Sir Frederick who gave a very different view. After giving a short account of the reorganization of the Army Medical Service which followed the South African war, Mr. McNeill alleged serious defects in its present administration which he traced to the failure to make use of the Army Medical Advisory Board. He alleged that Surgeon-General Macpherson was responsible for a terrible breakdown of the medical arrangements at the battle of Festubert. He was removed from the first army in France to another army, where he was responsible for a still greater failure at Loos. He was then removed to Salonika, where Mr. McNeill believed he still occupied a responsible post. Mr. McNeill proceeded to criticize the arrangement by which there were now two Directors-General, one in London and the other in France. He believed that, in consequence, it was a matter of chance whether arrangements made in London were carried out across the Channel. He considered the present organization of the Army Medical Service unsound, because it was based upon the combatant division as its unit. That system was suitable to a mobile army, but not to one fixed, as the British army had been in France. When a division was moved a short distance it was absurd to move all its medical equipment; it should be retained in the place to serve with the incoming division. He believed the divisional system to have been responsible for the scandalous failure in some respects at Gallipoli, and for that which, if information now coming to hand was correct, was nearly as bad in Mesopotamia. He said that the selection of Poperinghe as the clearing station for the first battle of Ypres was unfortunate, as there was only one available road to it: troops and supplies blocked that road, and there was consequently great delay in getting away the wounded. At Hooge doctors of one division whose troops were engaged were working for thirty, forty, and even fifty hours on end. They were overworked, but they had worked as doctors had always worked throughout the campaign—with a devotion and energy and an industry beyond all praise so far as individuals were concerned. At the same time there were numbers of doctors actually in the town doing nothing simply because they belonged to other divisions. He alleged that of 200 patients from Ypres 80 were forgotten and left for seven days without medical attendance, yet all through the battle, owing, as was said, to some dispute between the R.A.M.C. and the Red Cross, there were numbers of motor ambulances doing nothing at Calais and Boulogne. That was early in the war, but at Loos thousands of wounded men were left lying all night in the open because hospitals were overfull and the staffs overworked, yet within a few miles there were hundreds of doctors of other divisions doing nothing, who could easily have been brought up by motor car. It was not the fault of the doctors, who were anxious to go, but of the system. A telegram was sent to the base for more doctors, but they were not allowed to start for four days while they were waiting to get the necessary papers signed. When they did arrive the wounded who had been suffering for want of attendance had been removed. Some days before the attack at Loos some of the field ambulances, probably under the direction of zealous men of common sense, collected a large number of stretchers, but Surgeon-General Macpherson ordered them to be taken away, because they were above the regulation number. These examples showed not only that the system was unsuitable for the fighting of to-day, but that it was administered with a rigid adherence to formula and rule. Further, the best use had not been made of the medical talent at the disposal of the nation; men of high professional attainments were enlisted and placed in junior posts. Instead of employing these men, who were in the prime of life and of their scientific knowledge and skill, in positions of command, the War Office brought back old pensioners of the R.A.M.C. and put these "dug-outs" in command. Under the present system it was impossible to get the rapidity necessary between the infliction of the wound and the operation. Motor transport had revolutionized conditions, and had rendered the field hospitals close to the front useless. There ought to be, in their place, all the way along the front, a system of movable hospitals, combining the functions of the field hospitals and the clearing stations, and within easy access, by motor car, of the firing line. Each ought to be in charge of a first-rate surgeon, and thoroughly equipped for up-to-date surgery. They should be established off the main road, which must be kept clear for the transport of supplies and troops, and should have easy lateral communications between one part of the line and another. This would make it possible to do away with the field hospitals and field ambulances. He considered that Sir Frederick Treves's statement that operations could be performed within two or three hours of the casualty referred to quite exceptional circumstances. The opinions he had expressed were those held by a very large body of highly instructed medical opinion. He hoped that the Government would appoint three or four thoroughly competent persons—not necessarily doctors, but perhaps including one doctor—to go to France to visit the hospitals there, to examine practitioners who have been in those hospitals and at the front, and to report whether there had not been a very considerable and unavoidable breakdown. Major Astor, who followed, said that he had seen a good deal of the medical service unofficially, was

associated with a fairly big hospital and had seen the way in which the wounded were brought over from France and the way they were landed at Southampton, and had visited some of the hospitals. From this experience he did not think matters were as black and serious as Mr. McNeill had painted them. He paid a tribute to Sir Alfred Keogh, whom he had found singularly accessible, anxious to investigate any question, whether large or small, and particularly fresh in mind.

Mesopotamia.

Mr. Long, who, in the absence of the Premier and the Secretary of State for India owing to illness, replied for the Government, admitted that serious defects had been disclosed in Mesopotamia. The Viceroy and the Commander-in-Chief in India had some weeks ago decided to send Sir William Vincent, a distinguished Indian Civil servant, and General Bingley, an Indian officer, to Mesopotamia to conduct an inquiry into the medical arrangements, and to make good deficiencies. The War Office had already supplied two Indian general hospitals complete and the personnel of two more, a British stationary hospital with 400 beds, and a British general hospital with 1,040 beds. During the last month 100 doctors and 100 orderlies had been sent, and the War Office had offered to meet, and believed it was able to meet, any demands that could be made upon it. Whatever reason there might be to believe the stories that reached this country, no effort had been spared, or would be spared, to do everything that should be done and ought to be done in the circumstances.

The Speaker was got out of the chair after dinner and the House went into Committee on the Estimates.

War.

Medical Examination of Recruits.—In reply to a question by Mr. Anderson, on March 8th, the Financial Secretary to the War Office said that subject to certain limitations, the usual fee for medical examination was 2s. 6d. a man. If within three months the man was found to have been improperly passed the doctor was liable to refund the fee. In reply to further questions on the following day, Mr. Tennant stated that he was glad to have the opportunity of contradicting categorically the statement that recruiting medical officers were paid only for recruits they passed as sound. It was the examination that was paid for, and the pecuniary result to the examining medical officer was the same whether he accepted or rejected a recruit. This had already been stated on several occasions. A medical man holding a commission received no fees for the examination of recruits. Mr. Snowden, who asked one of the questions, alleged that recently men had been passed as fit for military service who had artificial legs; who were so mentally deficient that they were unable to understand or answer any question; or who had never done any work for years on account of daily attacks of epilepsy. Mr. Tennant, in his reply, said he could not accept such statements as being anything else than an incorrect representation of the results of the work of the examining medical officers. "I think," he said, "that instead of being held up to obloquy they deserve support and recognition in the heavy work they are patriotically doing on behalf of the country."

Medical Unfitness.—In a written reply to Mr. Crooks, who asked whether a man certified as medically unfit on Army Form B 2512A by an officer R.A.M.C. at a recruiting office since August 14th was entitled to an armlet, Mr. Tennant stated that an armlet was only given to men who had been rejected as medically unfit, if, on re-examination, they were found to be suffering from serious organic disease. If, on re-examination, they were not found to be so suffering, they were attested, and classified in their category in the reserve.

Lunacy Institutions.—In written replies to questions addressed to the Home Office, Mr. Brace has stated that the new Hampshire Asylum is to be used by the military authorities as a hospital for sick and wounded soldiers, and not for cases of nervous and mental affections. The whole of the Middlesex County Asylum at Napsbury was being handed over to the War Office, and the patients under treatment there were being distributed over other asylums as near as practicable to Middlesex. The asylum will be used for sick and wounded soldiers, but it is still intended to receive there a certain number of soldiers suffering from nervous and mental affections of the same type as those now under treatment in the detached part of the institution already adapted as a war hospital. In reply to other questions with regard to lunatic asylums the President of the Local Government Board has stated that two of the Commissioners of the Board of Control had, at the request of the War Office, undertaken the continuous supervision of the scheme for the use of certain asylums as war hospitals, and had thus, to a large extent, been withdrawn from their ordinary functions. Another commissioner and one of the inspectors had been absent on military duty since the beginning of the war, and more than half the clerical staff had joined the forces. The work of the commissioners in connexion with lunacy had been increased rather than diminished by the handing over of lunatic asylums for use as war hospitals. The concentration of patients into a smaller number of asylums had not diminished their number, had demanded even closer supervision than formerly, and had involved difficult administrative and financial arrangements. The expenditure of the Board had been reduced in many directions, and the estimates for the coming year would show a large reduction.

Officers' Income Tax.—In reply to a question by Mr. Bennett-Goldney, on March 9th, Mr. McKenna said that the method of paying income tax by deduction from salary was applicable to all Government servants, and was not confined to naval and military officers. In reply to a suggestion in the question that he would so adjust the new income tax regulations that the pay of all officers amounting to and including £400 a year should be exempt from income tax, Mr. McKenna said that he was unable to anticipate his next financial statement.

THE WAR.

CASUALTIES IN THE MEDICAL SERVICES.

ROYAL NAVY.

IN the list of casualties issued by the Admiralty on March 9th as occurring in consequence of the sinking of the mine sweeper H.M.S. *Arabis* on February 11th, is the name of Surgeon Probationer John Hughes, R.N.V.R., unofficially reported to have died as a prisoner. It has been stated in the press that Mr. Hughes died from exposure, and was buried in the naval garrison cemetery at Wilhelmshaven with military honours.

ARMY.

Wounded.

Captain S. S. Greaves, R.A.M.C.(T.F.), France.

DEATHS AMONG SONS OF MEDICAL MEN.

Beale, Clifford William, Lieutenant 7th Royal Sussex Regiment, who was killed on March 2nd, aged 23, was the only son of Dr. and Mrs. Clifford Beale, of Allan Down, Rotherfield, Sussex, and nephew of Sir W. Phipson Beale, Bt., K.C., M.P. He was educated at Warren Hill, Eastbourne, and at Harrow (Sir Arthur Hort's House), subsequently obtaining a scholarship at Gonville and Caius College, Cambridge. He shot for Harrow at Bisley, and was an active member of the O.T.C. both at school and college. He graduated in the Natural Sciences Tripos at Cambridge in 1914, and was captain of his college boat club and of the crew which won the Thames Cup at Henley in the same year. He enlisted as a private in the Public Schools and Universities Battalion, but subsequently obtained a commission in the 7th Royal Sussex Regiment, with which he had been serving abroad since last May. He was gazetted lieutenant in January, 1915, and had recently been appointed to a light mortar battery.

Bowhay, Eustace G., Captain 1/6th Battalion Devonshire Regiment (T.F.), killed in action in Mesopotamia on March 8th, was the second son of Dr. Bowhay, Gunnislake, Tavistock, and was 26 years of age. Educated at Skinners' School, Tunbridge Wells, he was gazetted to the 5th Duke of Cornwall's Light Infantry in 1909 and transferred to the Devon Regiment in 1913. He obtained his company shortly before proceeding to India in October, 1914. Captain Bowhay was in practice as a solicitor at Torrington, North Devon. He was clerk to the borough magistrates and steward of the town and alms land charities.

Johnston, H. A., Second Lieutenant Royal Flying Corps, son of Dr. Johnston of Stranorlar, County Donegal, killed in France on March 4th, aged 24. He was educated at Trinity College, Dublin, and before the war was a wireless installation expert in the firm of Siemens and Co. Enlisting early in the war, he got a commission a year later. He was killed by a shell while on leave for the day.

Mason, Arthur Edward Knight, Captain 7th, attached 8th, Battalion, Royal Fusiliers, only son of Dr. Arthur Mason, Oakwood, Walton-on-Thames, killed in France on March 2nd, aged 22. He was educated at Cheltenham and at Exeter College, Oxford, and got his first commission on August 15th, 1914, was promoted to lieutenant on February 2nd, 1915, and recently to captain. He had previously been wounded in April.

MEDICAL STUDENT.

Sangster, William Campbell, Lieutenant 4th Battalion Gordon Highlanders, reported missing on September 25th, 1915, was killed in action on that date. He was the son of Mr. William Sangster of Rubislaw, was a graduate in Arts of Aberdeen

University, had entered as a medical student, and when war broke out was commencing his second year. He received his commission as second lieutenant in the 2/4th Battalion on October 4th, 1914, was transferred to the 1/4th Battalion in June, 1915, and went to the front almost immediately.

NOTES.

LIEUTENANT-COLONEL W. H. WILLCOX, R.A.M.C., M.D., F.R.C.P., has been appointed consulting physician to the Mesopotamia Expeditionary Force, with rank of Colonel.

ANGLO-RUSSIAN HOSPITAL.

Dr. T. J. Horder, who was appointed physician to the Anglo-Russian Hospital, is serving as medical adviser in London to the hospital. Dr. Gould May is acting as physician to the hospital in Petrograd.

Lieutenant-Colonel T. E. Sandall, who was invested with the C.M.G. by the King on March 11th, had practised at Alford, Lincolnshire, down to the time when the Territorial Force was mobilized at the beginning of the war. He was then lieutenant-colonel commanding the 5th (Territorial Battalion) of the Lincolnshire Regiment, and had received the Territorial decoration. While commanding his battalion in France he was wounded, but is now convalescent. He graduated M.B., B.C. Cambridge in 1895.

HONOURS.

The list of officers commended for service in action, mentioned in dispatches from the Vice-Admiral Commanding the Eastern Mediterranean Squadron covering operations in the Gallipoli Peninsula, contains the names of Deputy-Surgeon General O. W. Andrews, M.B., R.N., and Fleet Surgeon John Menary, R.N. The list of commendations also contains the name of Midshipman H. D. Johnston, R.N., the son of Dr. R. McKenzie Johnston of Edinburgh, who has been awarded the D.S.C. He was assistant to Commander Swabey, Naval Observation Officer, Cape Helles, since July, 1915, and the distinction has been conferred upon him for having "shown great ability and resource in his most important duties."

MEDICAL OFFICERS WANTED.

3/1st Notts and Derby Mounted Brigade Field Ambulance, R.A.M.C.(T.F.).

A medical officer is required for this unit; promotion to temporary captain after six months' approved service. Applications to Officer Commanding, No. 9 Lines, Rugeley Camp, Staffs.

3/2nd South Midland Mounted Brigade Field Ambulance.

A medical officer is required for this unit. Full particulars on application to Captain A. G. Levy, Commanding 3/2nd South Midland Mounted Brigade Field Ambulance, 1, Iffley Road, Oxford.

2/1st South Midland Mounted Brigade.

Three medical officers are wanted to complete Brigade at present on East Coast. Applications to Major D. M. Spring, S.M.O., R.A.M.C.(T.), Head Quarters, Hempton, Fakenham, Norfolk.

2/2nd South Midland Brigade Field Ambulance.

Medical officers are urgently required for this ambulance, stationed at King's Lynn. Must sign for foreign service. Applications to Major H. G. Magrath, O.C., London Road, King's Lynn.

Ireland.

THE committee in charge of the testimonial to Dr. Power of Ardfinnan has decided not to close the fund until March 25th, and asks intending subscribers to send their subscriptions as soon as possible to Dr. J. H. Jellett (Treasurer), 11, Beresford Place, Waterford.

Last week Dr. John L. Power, dispensary medical officer, Castlemartyr, who has joined the R.A.M.C., was entertained to dinner at Mogeely, and a presentation was made to him on behalf of the people of the district.

The medical practitioners of the county Wexford presented a silver tea and coffee service to Dr. William W. Murphy, Coolgreany, in recognition of the able services he has rendered for twenty years, not alone to the local profession in county Wexford but to the entire profession in Ireland, with whom he is most popular.

At a meeting of county Wexford medical practitioners on March 1st the following resolution was unanimously passed:

> That at this our first meeting since the settlement of the certification question, we, the county Wexford medical practitioners, wish to record our appreciation of the valuable services rendered to the whole profession in Ireland by our able, worthy, and tireless friend, Dr. Thomas Hennessy, and hereby tender him our very best thanks for his able and painstaking care of our interests, and congratulate him personally on the success of his tactics.

At the last meeting of the Swinford guardians a letter was read from the Local Government Board declining to sanction the appointment of Dr. Martin Sweeney permanently as medical officer for the Charlestown dispensary district. The Board considered that it would not be fair that in the absence of men who had volunteered for service in the army, young men should secure election to vacancies which may arise. Dr. Sweeney refused to act temporarily, and it was agreed to advertise for a temporary medical officer.

IN the White Paper issued last week regarding the Civil Service Estimates for the coming financial year, the amount estimated to be required for hospitals and charities in Ireland is £16,778, a decrease of £75 on the present year. The grants to the various hospitals remain unchanged. The grants to public infirmaries are unchanged at £223.

A number of vaccination defaulters have been prosecuted recently in Queen's county. At Abbeyleix the magistrates allowed the charges to be withdrawn on the defendants undertaking to have the children vaccinated within a fortnight. At Maryborough fines of 10s. and costs were imposed in nineteen cases, nine others were adjourned, and in seventeen the summonses were withdrawn owing to defective service of notices.

THE DANGER OF SMALL-POX.

Sir Charles Cameron has written to the public press drawing attention to the fact that small-pox is spreading in England, and has visited Manchester, Salford, and Cardiff, towns with which Dublin is in daily communication. It is to be regretted, he says, that the belief in the efficacy of vaccination in the prevention of small-pox, and of its power to lessen the severity of its symptoms, has seriously declined of late years. This, he thinks, may be partly due to freedom from the disease for some years past. It is certain that there are many unvaccinated persons in Dublin, and the hope is expressed that boards of guardians will enforce the provisions of the Vaccination Act.

Scotland.

AT the meeting of the Royal Society of Edinburgh, on Monday, March 6th, the following medical men were amongst the new Fellows elected: Percy Theodore Herring, M.D., F.R.C.P.Ed., Professor of Physiology, St. Andrews, and Robert Muir, M.A., M.D., Sc.D., F.R.S., Professor of Pathology, University of Glasgow.

A Scottish Red Cross hospital ship, the *St. Margaret of Scotland*, destined for service in Eastern waters, is now ready. She is a vessel of 2,300 tons, originally employed in the inter-colonial mail service in the West Indies. She has been converted into a hospital ship under the superintendence of an Admiralty representative. The cost has been defrayed out of the flag day of the Scottish branch of the Red Cross Society last October, by which the sum of £21,000 was realized. She has accommodation for ninety-two patients in seven wards, named Clyde, Forth, Tay, Tweed, Dee, Spey, and Doon; over eighty emergency hammocks can be slung. Sir George Beatson, speaking at an inspection of the boat on March 7th, said that she was the latest example of the equipment of a hospital ship.

At a meeting of the Glasgow School Board on March 9th a resolution was proposed by Mr. G. D. Hardie and seconded by Dr. Grant Andrew in favour of taking steps immediately to provide classes, as centrally situated as possible, for children of school age suffering from myopia and defective sight. The proposal was referred to the special schools and medical inspection committees for consideration.

Correspondence.

MEDICAL RECRUITING: ENROLMENT.

SIR,—The Secretaries of the Central Medical War Committee have been good enough to suggest that I should write to you and state what the medical men in my area have done in connexion with their appeal for enrolment.

We called a meeting, at which were present all the doctors in the district except those already holding commissions or working in hospitals in France, and, after due discussion, by the unanimous vote of all those of military age it was decided that every man should forthwith enrol.

This they have done. Needless to say, it is out of the question that they all can be spared or that they all feel their circumstances permit them to go; but they have enrolled, intending that their district should do its share, and trusting to the conditions laid down in the Committee's circular of February 17th to the effect that only those who can be spared with due regard to the needs of the community should be required to go, that the difficulties of those whose ties make leaving their practices a *serious* hardship shall be considered by the Local Medical War Committee, and that finally they should not be called up unless the response to the call for enrolment from men of military age throughout the country justifies it.

It should be a simple matter to call a meeting of medical men in each area to confer over the question of enrolment, as we have done. Our members are few in comparison with those in many districts, which simplified matters for us. But though unanimity is not to be expected everywhere, such meetings and discussions would be an immense help to the work of the Central Medical War Committee. As the Secretaries say in their letter to me, "All difficulties would disappear could we count on such loyalty and foresight in every area." Being personally well past military age, I may safely quote this remark.—I am, etc.,

F. CLAUDE EVILL,
Chairman, Barnet and District Local Medical War Committee.

High Barnet, Mar. 15th.

GUNSHOT WOUNDS OF THE HEAD.

SIR,—The observations published by Colonel H. M. W. Gray in the JOURNAL of February 19th (p. 261) will be read with interest by a large number of surgeons who are now called upon, or may be called upon in the future, to deal with a very serious group of war injuries. I am not competent to criticize those observations bearing on such surgical methods of procedure as are best calculated to prevent sepsis, but there are some statements made and some advice given in Colonel Gray's paper which, from a neurological and pathological point of view, can hardly be accepted without hesitation. One of the principles enunciated at the beginning of the paper is couched in the following terms:

> That we can prevent permanent disability in most cases by systematically removing foreign material or displaced bone from the surface or substance of the brain whenever these are accessible to legitimate surgery.

This is a remarkable statement as it stands, and still more remarkable when we realize that "permanent disability" must include various forms of paralysis, disorders of speech, disorders of the special senses, and traumatic epilepsy, as well as mental derangement, and that no evidence is offered as to the permanent condition of his cases after the "complete" operation he so strongly advocates. It is the permanent condition of these unfortunate victims of the war which chiefly interests us, and upon which claims for the superiority of any particular method of treatment must surely be based. Those of us who are watching and treating these patients after their removal from the base hospitals may form in the course of time some opinion as to the accuracy of Colonel Gray's claim. Meanwhile, I cannot help feeling that some of his principles are founded on the old fallacy that the presence of foreign material rather than the injury to brain substance is the origin of such disorders of function as paralysis and epilepsy.

Let me enunciate a few principles which can hardly be contradicted, and which may be useful for surgeons to remember when dealing with head injuries.

When a foreign body penetrates the brain substance it either carries with it infection or it does not. In the former case there is reason to believe that those parts of the track through which the foreign body has passed lying nearest the surface are more infected than those lying at a greater depth, and the removal of the foreign body will not remove the infection, although it may sometimes favour the action of the surrounding healthy tissue in overcoming the raid of sepsis. Whether it is a source of infection or not the foreign body cannot be removed without additional destruction of the brain, the results of which are often permanent. At the present moment there must be hundreds of patients in England with pieces of metal in their brains which are not producing symptoms, and only future records and statistics can decide how far the presence of these foreign bodies is harmful. Who knows whether there may not be an advantage in the possession of a foreign body inaccessible to legitimate surgery? The amount of permanent paralysis, loss of speech, loss of vision, etc., must depend on the amount of destruction of brain tissue, whether produced by the missile, by pieces of bone, by the surgeon's finger and scoop, or by sepsis. In some cases sepsis is the most dangerous enemy, in others the surgeon's finger and scoop. Missile and bone will destroy brain tissue whether we desire it or not, but in most cases the track of destruction caused by the surgeon will be greater than that of other foreign bodies. From these data it is only fair to conclude that each case should be considered and dealt with on its own merits, and that the general advocacy of "complete operation"—with its somewhat sinister but vague meaning—is dangerous advice to offer on the plea of preventing permanent disability.

The next point of importance is the question of opening the intact dura on the supposition or chance that it covers injured brain tissue.

> The pulped area—a mixture of useless brain matter and blood—is an immediate source of irritation to the surrounding brain, because it is virtually a foreign body. In the process of healing a great part of it is replaced by fibrous tissue—a scar—which forms a remote source of irritation.

This statement is bald and unconvincing when offered as a reason for opening the dura by a small crucial incision made by plunging the knife in for half an inch or so, with the result that pulped material or healthy brain matter wells out like grease from a collapsible tube. The following questions are pertinent in this connexion. What evidence of pulping of the brain can be obtained before opening the dura? How is the fact that the brain matter is useless recognized? What evidence is there that softened brain tissue is a source of irritation? Can the formation of a scar be prevented if the brain is really necrosed, and is not the scar much more likely to be "fibrous" when the damaged dura is involved than when that membrane is left intact?

In cases of cerebral haemorrhage, of cerebral softening, or of encephalitis no one would advocate the removal of useless brain matter and blood, and experience teaches us that the brain is quite capable of dealing with either by its own natural methods. If pressure must be relieved a lumbar puncture is the first remedy, and not one to be postponed until large masses of brain matter—much of which may be only temporarily injured—have been squeezed through a small opening, and encouraged to find a place in the sun by means of a pair of forceps.

The fear of epilepsy is very real, but no one has yet explained on what pathological basis this more remote complication depends; it certainly does not depend on the size of the scar. There is some reason to suppose that epilepsy is more likely to supervene when the scar involves the dura than when it does not. Probably it depends more on individual idiosyncrasy than on any other factor, and I am in the habit of prescribing many months of bromide treatment for all cases of brain laceration or bruising as a prophylactic measure.

There was prevalent some years ago, and it still lingers in some minds, an idea that traumatic epilepsy can be cured by operation if the surgeon can find a scar on the brain and remove it. For some reason or other the fact that another scar would replace the one excised was overlooked, and the temporary absence of fits over a period of some

months has often led to the premature belief that a cure has been achieved. I am sorry to say that I have never seen a case of traumatic epilepsy cured by such an operation, and that I have seen many patients the worse for the attempt. From this experience I conclude that it is wise to let the brain deal with its own necrosed tissue in its own way, and that the less the surgeon interferes the more "glial" and the less "fibrous" will be the resulting scar; for scar there must be.

Moreover, a careful neurological investigation of the patient will often reveal the fact that the brain has been injured, perhaps pulped, in parts quite remote from the site of the direct injury, and in order to be consistent those areas, if Colonel Gray's advice be followed, should be exposed by trephining and incision of the dura mater.

On page 262 Colonel Gray has a short paragraph on "Operations where wounds of the blood sinuses are present." It commences with the statement that these are done as a matter of course, because it is thought advisable to remove fragments of bone which cause obstruction to the return of blood from any part of the brain. I am tempted to inquire whether the removal of the depressed bone is attended by a return of the venous circulation or whether the surgeon is not forced in the course of his operation to promote further thrombosis in order to check the alarming haemorrhage which may occur when the sinus is exposed. The only harm caused by the depressed bone may be interference with the circulation in the lacunae and cortical veins, and the remedy proposed is calculated to make this condition irremediable. Colonel Gray says that out of fourteen cases operated on only one died, but it is the permanent result which interests us, and I should like to show him the extraordinary recoveries which are made by some of these cases which have never been operated on. Nothing has impressed me more in connexion with the cranial surgery of the war than the success of the conservative methods adopted and advocated by many British and French surgeons, not only in these cases but in dealing with depressed bone and foreign bodies as a whole. In their practice surgical interference is considered from the point of view of the brain rather than that of the skull or of the foreign body.

The *post hoc propter hoc* method of reasoning is notoriously misleading, and the mere fact that a patient recovers from paralysis after an operation is not sufficient to credit the operation with the achievement. It is an almost daily medical experience of civil life to see paralysis clearing up in a few hours or a few days without any operation. On the other hand, it cannot be denied that the opening of an intact dura and the attempt to remove foreign bodies must often destroy more or less healthy brain tissue, with all the inevitable results which follow such destruction. For this reason it is difficult to urge too strongly that each case should be treated on its merits, and that no authoritative dictum in favour of complete operations should be allowed to bias the surgeon in his difficult task.—I am, etc.,

London, W., Mar. 13th. E. FARQUHAR BUZZARD.

DELAYED TETANUS.

SIR,—Quite recently four cases of tetanus occurring in soldiers at apparently long intervals after being wounded have been reported, namely, one by Dr. Penhallow from the American hospital at Paignton,[1] three by Lieutenant-Colonel Gilbert Barling from Birmingham;[2] these cases are respectively stated, the first as "a case occurring two months after being wounded," and the other three as cases with "incubation" of fifty-one, fifty-three, and forty days respectively.

I venture to suggest that three at any rate of these cases are cases not of long incubation of tetanus but rather of prolonged presence in the wounds of anaërobic organisms—that is, they belong to the class of cases to which attention has been drawn by Colonel Bond of Leicester. In passing, I may say that I have seen a good number of cases in which there has been evidence of the prolonged presence of quiescent organisms; how long they may stay I know not. One case that came under my care suggests a very long time, and is worth referring to.

A man with a compound gunshot wound of the thigh inflicted on April 25th, 1915, was treated in an auxiliary hospital; operations were performed on May 3rd, June 13th, and July 16th, 1915. He was sent to Netley healed and sound on November 19th, 1915, 208 days after the original injury. A few days later he fell down and refractured his thigh, the temperature rose, the thigh became swollen, and the scar suddenly gave way with a severe haemorrhage. A large gas containing abscess was found in which the gangrenous femoral artery had given way. In my absence Captain Woods ligatured the common femoral at Poupart's ligament and the man has made an uninterrupted recovery.

This is the longest persistence of gas-forming organisms that I have come across.

Dr. Penhallow's case of tetanus was given ether on December 4th to overcome some deformities. Pain in the masseters occurred a week later, and still five days later definite tetanus occurred. Is not this a case of Colonel Bond's residual germs with tetanus of twelve days' incubation? Similarly, in Colonel Barling's first case, an abscess was opened on September 24th, ten days before tetanus appeared; his second case had a sharp foreign body removed on November 13th, four days before the onset of tetanus. In Colonel Barling's last case the wound was healed on October 27th; tetanus appeared on November 3rd; there is no record of any fresh trauma after the infliction of the original wound, and if none such occurred this would seem to be a definite case of prolonged "incubation."

I now come to the point which has induced me to pen these lines: It is to draw attention to the grave danger of any trauma to a granulating surface where there is a possibility of the presence of tetanus organisms.

In a small series of cases of tetanus which I hope to publish later is one of a man, apparently otherwise doing well, who had a slight rise of temperature, which appeared to be due to insufficient drainage of his wounds, which were on either side of the leg and communicated fairly freely. With a threaded probe I passed a drainage tube through with perfect ease and without using the slightest force. There ensued a slight fall in temperature, but his tetanic symptoms rapidly became much worse, and the temperature shortly began to rise rapidly. The attack of tetanus assumed an exceedingly acute form, and death occurred in about eighteen hours with a temperature of 109°, and, on retaking for verification, of 109.4°.

Evidently the trifling act of slipping a drainage tube through this man's wound led to the absorption of a fatal dose of the tetanus poison present. I have since been careful not to interfere with wounds in tetanus patients, and "to let sleeping dogs lie."—I am, etc.,

RUSSELL COOMBE, Major R.A.M.C.(T.),
March 13th. Operating Surgeon, Netley Hospital.

MURMURS IN THE RECRUIT'S HEART.

SIR,—I have followed with interest the discussion on Sir James Mackenzie's memorandum. The crux of the matter, so far as murmurs are concerned, lies in the words: "If the candidate's response to effort be normal and the heart normal in size the murmur is negligible." (Obviously systolic murmurs only are referred to.) This sentence admirably sums up the new teaching on the subject. Now the question is whether the new teaching is right.

My reasons for this letter are three. First, I know some examiners cannot make certain of the size of the heart. Secondly, I am seeing in men back from the front—and indeed in some who have never gone abroad—not hearts with negligible murmurs which have defied strain, but hearts with serious murmurs which ought never to have been passed—even aortic regurgitation (the lesion which the binaural stethoscope is so apt to miss) and mitral stenosis; one wonders how many remain abroad permanently. So that one questions the practical wisdom of any teaching which belittles the importance of murmurs. Thirdly, I do not admit that the knowledge gained during recent years has scrapped all that went before. To claim that is merely to repeat the cry of every new dogma. I do not think we can examine a heart almost without a stethoscope, as some appear to imagine. In the heart, as elsewhere, there must be the little rifts within the lute, and it does not seem common sense to widen them, although they cause no uneasiness in civil life, nor, as yet, any discoverable cardiac enlargement.

I would urge not only keenness for numbers, but caution in their selection. Any well-educated medical man knows of systolic murmurs which he can regard as unimportant—

[1] *Lancet*, February 26th, 1916, p. 464.
[2] BRITISH MEDICAL JOURNAL, March 4th, 1916, p. 337.

for example, one class to which Sir James Kingston Fowler has drawn attention, the so-called "respiratory murmurs." Where a murmur is reasonably in doubt, the recruit should be given the benefit of that doubt. It is not well to be rash with other people's risks.—I am, etc.,

Exeter, March 11th. W. GORDON.

VISUAL NEUROSES OF MINERS.

SIR,—I do not desire to lay any stress on the mere title of my paper, "Visual neuroses of miners." My only reason for adopting it was that I felt strongly that too much stress had been laid on the presence of nystagmus in these cases, which at best is only a symptom, and which seemed to me to have prevented due attention being given to the disease by neurologists and physicians generally, who should undertake its treatment.

I should like, on the other hand, to emphasize the fact that I was describing the disease commonly known as "miner's nystagmus." I do not intend to suggest that a change of nomenclature should be made, as the malady has been too long known under this title to render an alteration convenient.

I must, however, express my surprise that Dr. J. A. Wilson should say in his letter (March 11th, p. 397) that "in 200 cases of nystagmus collected in a coal-mining area only 12 per cent. were miners." I must leave an answer to this statement to some of the many able men who have studied this subject in mining districts, as I have been unable to do. If Dr. Wilson's contention were really accurate—that the whole train of symptoms which Dr. Llewellyn has given as denoting miner's nystagmus can be found to be more prevalent in the general population than in miners—we shall have reached almost a *reductio ad absurdum*.—I am, etc.,

March 13th. CHARLES F. HARFORD.

Obituary.

ARCHIBALD CARMICHAEL, M.D.,

BARROW.

DR. ARCHIBALD CARMICHAEL of Barrow-in-Furness, who died at Perth on February 22nd, graduated M.A.Aberd. in 1868, M.B. in 1871, and M.D. in 1873. He went to Barrow in 1871, and two years later joined the late Dr. Stark in partnership. He was appointed honorary surgeon to the North Lonsdale Hospital at Barrow, and was closely identified with that institution down to 1901, when he retired from the active staff, and was appointed consulting surgeon. He was certifying factory surgeon and medical referee under the Workmen's Compensation Act. In addition to a large practice, he had an extensive consulting connexion and was an enthusiastic member of the local clinical society. Although he never consented to accept any office in the British Medical Association, he was always deeply interested in its welfare. He was a strong opponent of the Insurance Act, and refused to join the panel. Some six months ago he was compelled by failing health to take a prolonged holiday. He hoped to return to Barrow to continue his consulting practice. Whilst walking near Perth, where he was staying with his sisters, he died suddenly by the roadside. By his death the profession in Barrow has lost a distinguished member and valued friend. The funeral took place at Perth on February 25th.

Dr. SETTLE writes:

Being one who knew the late Dr. Carmichael perhaps longer and more closely than any one else in the profession, I have been asked by his friends here to speak of him as I knew him. His coming to Barrow was synchronous with mine about forty-five years ago. His success and reputation soon caused him to be appointed honorary surgeon to the North Lonsdale Hospital, where his care and skill as an operator combined with the merit of his private work to make him well known by the prospective sick of North Lonsdale, so that to his general work was soon added a wide and lucrative consulting practice. Dr. Carmichael's work was marked by carefulness, and, like many of exceptional merit, he was a modest man. His work was honest work, and, unlike the practice of many of less merit, he refrained from the adventitious aid of reporting and pamphleteering. His modesty also prevented him taking up public positions. Even in our local clinical society, of which he was a devoted member, he seemed to enjoy most to be a simple member, although his ripe experience, exhibited when he joined the discussions, added greatly to their value. In politics he was Conservative. In religion I believe he belonged to an old Roman Catholic family, but I understand scientific reading had disturbed his allegiance to that Church. Many years ago I had occasion to see the late Sir Jonathan Hutchinson. Our business being finished, he spoke to me in high terms of admiration of Dr. Carmichael's merits. I believe Dr. Carmichael died as he expected and hoped he would die.

THE LATE DR. R. DRUMMOND MAXWELL.—Dr. H. R. Andrews writes: "I should like to add a few words to what was said in last week's number about my late colleague. After holding the appointments of house-physician, house-surgeon, and receiving-room officer at the London Hospital, Maxwell served as civil surgeon in South Africa. At the end of the war he became resident medical officer at Queen Charlotte's Hospital. He developed at this period of his life a solidity of character and a continuity of purpose which impressed those with whom he worked. From this time onwards he devoted himself to obstetrics and gynaecology. For some years he attended most regularly all the gynaecological operations at the London Hospital, though there was no prospect of a vacancy on the staff, and soon constituted himself as a sort of unofficial registrar, and a very useful one. In 1907 he was appointed obstetric registrar and tutor at the London Hospital. From that time until his death he worked with me almost continuously and always harmoniously. In 1912 he was appointed assistant obstetric physician. He was a loyal, cheery, and unselfish colleague, an able and popular teacher, and a skilful and successful operator. For the greater part of last year, during my illness, he bore the burden of the obstetrical and gynaecological department of the London Hospital with little assistance, working unselfishly and cheerfully, although he longed to go out to France. During the last few months he had taken up physical culture with much energy, and used to swim twelve lengths of a swimming bath every evening, and sprint afterwards, besides doing various exercises. He told me a few weeks ago that he had derived great benefit from this, and that his sense of bodily fitness had not been so great for some years. The end came with shocking suddenness. On Saturday, March 4th, he wrote to the hospital saying that he would operate as usual on the following Monday. On the morning of Sunday, March 5th, he was operated on, and he died twenty-four hours later. His loss will be long and deeply felt at the London Hospital, and is a very real one to me. He was an enthusiastic member of the Gynaecological Visiting Society, no meeting of which could be considered to be complete without his lively and stimulating presence." We may add that he was elected assistant surgeon to the Samaritan Hospital in 1908, resigning when he was appointed assistant physician to the London Hospital.

THE LATE LIEUTENANT BERNARD B. GOUGH, R.A.M.C.—Staff Surgeon W. Kenneth Wills, M.B., R.N.V.R., has sent the following appreciation:

To have known Gough for a period of nearly twenty years is to have had a twenty-years-long privilege. Few may have pierced his peculiar reserve, but to those who did there was a very different character beneath than that which was suggested on the surface. He was at his best with children in the open. A lover of wild things he had the rare gift of opening the eyes of others to the beauty of the world around, and knew where Pan hid his treasures from the curious. But with adults he was peculiarly diffident, and one might have easily missed that kindliness, of which many a poor patient will tell to-day with tears, and that sterling character of which his intimates had ever and anon fresh revelations. Gough, or "B. B." as he will ever be to his old Guy's friends, could never force himself forward, and when he volunteered for the war no one can gauge what it cost him. He was ever governed by high principles, and loyalty to the loftiest motives always found its response in his life and conduct. When he heard the call of duty he never wavered, but gave his all cheerfully. I was privileged to see him on his way through a south coast town to the front, and though he said nothing of his distaste for the employment of war, I could appreciate to some extent the sacrifice of himself it had been to offer for war service. The

sacrifice offered has been accepted to the full. The old days at Guy's and the more recent days in his country practice in the picturesque Mendip village of Compton Martin are over, and I feel that one of the beloved characters of Life's Book has gone out of the story and that much of the charm has gone too.

SURGEON-GENERAL CHARLES EDWIN MCVITTIE, Madras Medical Service (retired), died at Exmouth on February 17th. He took the L.R.C.S.I. in 1865, and the Fellowship in 1874, and the L.R.C.P.Edin. in 1866. He entered the I.M.S. as assistant surgeon on March 31st, 1866, became surgeon on July 1st, 1873, surgeon-major on March 31st, 1878, deputy surgeon-general on March 7th, 1891, and surgeon-general on April 1st, 1895, retiring on April 1st, 1900. A good service pension was conferred upon him from May 17th, 1894, and on March 23rd, 1898, he was appointed honorary physician to the Queen. He served in Afghanistan in 1880, receiving the medal, and in Burma in 1886–7, when he was mentioned in dispatches, in G.G.O. No. 434 of 1887, and received the medal with two clasps.

DEPUTY SURGEON-GENERAL EUGENE FRANCIS O'LEARY, R.A.M.C.(retired), died at Sidmouth on February 20th, aged 80. He took the diploma of M.R.C.S. in 1856, and the degree of M.D.R.U.I. in 1870. He entered the army as assistant surgeon on February 9th, 1856, became surgeon on February 9th, 1868, and surgeon-major on March 1st, 1873, retiring as brigade surgeon, with the honorary rank of deputy surgeon-general, on December 12th, 1883. He served in the Egyptian war of 1882, and received the medal and the Khedive's bronze star.

BRIGADE SURGEON EDWARD ACTON GIBBON, of Sleedagh, co. Wexford, High Sheriff of Wexford, died there on February 15th, aged 80. He was educated in Dublin, and took the diplomas of L.R.C.S.I. in 1858 and L.K.Q.C.P.I. in 1860. Entering the army as assistant surgeon on September 1st, 1858, he became surgeon on September 1st, 1870, and surgeon-major on March 1st, 1873, and retired with a step of honorary rank on March 12th, 1880.

LIEUTENANT-COLONEL ALFRED JOHN BELEMORE, R.A.M.C. (retired), died at Brighton on February 4th, aged 76. He was educated at St. Mary's, took the diplomas of M.R.C.S. and L.S.A. in 1861, and joined the army as assistant surgeon on April 16th, 1862, becoming surgeon on March 1st, 1873, and surgeon-major on April 16th, 1874, and retiring on March 22nd, 1888. The *Army List* assigns him no war service.

SURGEON-MAJOR ARTHUR SANDERSON, R.A.M.C. (retired), died at Joanville, Jersey, on January 23rd, aged 81. He took the diploma of M.R.C.S. in 1857, entered the army as assistant surgeon on January 12th, 1859, became surgeon on January 12th, 1871, and surgeon-major on March 1st, 1873, retiring on March 28th, 1890. The *Army List* assigns him no war service.

DEATHS IN THE PROFESSION ABROAD.—Among the members of the medical profession in foreign countries who have recently died are Dr. A. Morgan Vance, of Louisville, Kentucky, a well-known orthopaedic surgeon, aged 61; Dr. Pietro Da Venezia, for forty years physician-in-chief to the Ospedale Civile of Venice, aged 80; and Dr. R. A. Witthaus, for many years professor of chemistry at the Cornell Medical College, editor in conjunction with Becker of a treatise on medical jurisprudence, and author of numerous contributions on toxicology, on which he was a recognized authority, aged 69.

The Services.

TERRITORIAL FORCE.

MAJOR M. J. MAHONEY, M.D., attached to the King's (Liverpool Regiment), has been awarded the Territorial Decoration.

EXCHANGES DESIRED.

CAPTAIN T. CAMERON HOUSTON, R.A.M.C.(T.), 2/1st Lowland Mounted Brigade Field Ambulance, Cupar, Fife, Scotland, gazetted Captain October 2nd, 1915, wishes to exchange with a medical officer on active service, in any capacity.

Northern Command.—M.O. wishes to exchange; preferably for Cannock Chase district.—Address No. 1150, BRITISH MEDICAL JOURNAL Office, 429, Strand, W.C.

Universities and Colleges.

UNIVERSITY OF OXFORD.

Radcliffe Travelling Fellowship.

THE electors have elected George E. Beaumont, B.A., University College, to a Travelling Fellowship on the Foundation of Dr. John Radcliffe.

UNIVERSITY OF CAMBRIDGE.

AT a congregation on March 10th a grace was approved to the effect that, notwithstanding the regulations prohibiting any degree other than an honorary degree being conferred out of term, the vice-chancellor should be authorized to admit candidates to degrees in medicine and surgery at a congregation during the long vacation. This arrangement was made because, owing to the late date at which medical examinations in the Easter term are held, it was not possible for the class lists to be issued before the last congregation in Easter term, and the successful candidates would be placed at a serious disadvantage if unable to proceed to their degrees until Michaelmas term.

UNIVERSITY OF LONDON.

MEETING OF THE SENATE.

A MEETING of the Senate was held on February 23rd.

Mr. Thomas Yeates was recognized as a teacher of anatomy at the Middlesex Hospital Medical School and his name added to the Board of Intermediate Medical Studies and of Studies in Human Anatomy and Morphology.

The subject of the essay for the Paul Philip Reitlinger prize in 1917 is "The comparative treatment of native races in the British Empire."

Special War Regulations for Medical Students.—It was resolved:

That, from the present time until a date after the termination of the war to be fixed later by the Senate, Internal Students who have been debarred from presenti g themselves for examinations for medical degrees by service under the War Office or Admiralty, or by hospital service in connexion with the war, or by other approved service in connexion with national defence, be (i) permitted to enter at the First Examination for Medical Degrees in either (*a*) inorganic chemistry and physics, or (*b*) general biology, provided that the authorities of the schools to which they are attached shall recommend that they be permitted so to enter; (ii) credited with any subject in which they pass at the First Examination for Medical De rees or Second Examination for Medical Degrees, Part II; (iii) permitted, if they fail in Forensic Medicine only in Group I of the Third Examination for Medical Degrees, to present themselves for re-examination in that subject only in order to complete the examination in Group I; provided that they comply with the regulations in all other respects.

UNIVERSITY OF BRISTOL.

THE following candidates have been approved at the examination indicated:

SECOND M.B., CH.B.—B. A. Astley-Weston, Elizabeth Casson, R. F. White.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

AN ordinary council was held on March 9th, when Sir William Watson Cheyne, president, was in the chair.

Dental Surgery.

Diplomas in dental surgery were granted to twenty-eight candidates found qualified for the licence.

A report from the Board of Examiners in Dental Surgery was adopted by the council, and it was decided to inform the General Medical Council, with further reference to its letter of March 11th, 1915, that the council of the Royal College of Surgeons of England think that the present curriculum for dental students might be revised in accordance with the recommendations of the Board of Examiners in Dental Surgery without impairing the sufficiency of the guarantees for efficient practice contemplated by the Dentists Act.

General Medical Council.

Sir Henry Morris was re-elected the representative of the College in the General Medical Council.

Bradshaw Lecture.

Mr. Charters J. Symonds was elected Bradshaw lecturer for the ensuing collegiate year.

ON February 24th Mr. W. D. Spanton, consulting surgeon to the North Staffordshire Infirmary, presided at Stoke over the jubilee meeting of the North Staffordshire Field Club. It was founded in Mr. Spanton's rooms in the old North Staffordshire Infirmary at Etruria in April, 1865, and he was one of the first honorary secretaries. From his review of the fifty years' work of the club it appears that it has an archaeological section, with sketching and photographic sections which preserve records of buildings in the district, and sections on geology, entomology, zoology, botany, microscopy, and meteorology. It has a medal and a library founded in honour of past secretaries, and also a natural history museum, now under the aegis of the county borough authorities. A vote of thanks to Mr. Spanton, moved by two old members of the club, was cordially adopted.

Medical News.

DR. FRANCIS JOHN HARVEY BATEMAN, of Heath End, Blackheath, has been appointed a justice of the peace for the county of London.

A VIENNA manufacturer has given £20,000 for the foundation of an institute for the study of the proper food (*Volksernährung*) by correlating the results of research in organic chemistry, biology, and physiology.

DR. D. D. MAIN of the Church Missionary Society Hospital, Hankow, and Dr. Sidney G. Kirkby-Gomes, medical officer of the Peking-Mukden Railway, have received the King's permission to wear the decoration of the fourth and fifth class of the Order of the Excellent Crop, conferred upon them by the President of the Chinese Republic.

THE King has granted permission to the following members of the profession to wear the decorations of the class of the Order of the Nile indicated, conferred upon them by the Sultan of Egypt in recognition of valuable services rendered:—*Third Class:* Dr. J. B. Christopherson of the Sudan Civil Service. *Fourth Class:* Captain A. G. Cummins, M.B., R.A.M.C., and Dr. V. S. Hodson, M.V.O.

AT a recent massage examination held by the Incorporated Society of Trained Masseuses there were 201 candidates, of whom 131 passed, six with distinction. The list was headed by a blind student, Mr. P. L. Way. Among the other successful candidates were five blind students, one a surgeon, who were trained at the National Institute for the Blind, 246, Great Portland Street, London, W. In addition six blind soldiers passed the first part of the examination.

AT the annual meeting of the Cancer Hospital on March 10th, the chairman, Lord Northbrook, said that at the outbreak of the war an offer of the use of the hospitals, exceptionally well-equipped electrical and *x*-ray departments, and 50 beds had been accepted by the War Office. During the past year 57 soldiers had been admitted to the wards and 135 military patients had received treatment in the electrical and radio-therapeutic department; a large percentage of the cases treated were restored to health and to active service.

PROFESSOR ETTORE MARCHIAFAVA has been appointed to the chair of clinical medicine left vacant by the death of Professor Guido Baccelli. His name is best known by his work on malaria, but he has also made valuable researches on tuberculous and syphilitic arteritis, glomerulo-nephritis, and epidemic cerebro-spinal meningitis. He is a Grand Officer of the Crown of Italy, a Senator of the Kingdom, and President of the Società Lancisiana degli Ospedali di Roma, and a member of the Superior Council of Public Instruction.

UNDER the title of "Prophylactic Institute" an association has been formed in Paris whose object is to conduct a campaign for the gradual extinction of syphilis. Besides the direct treatment of patients, it will undertake scientific researches, and bring continuous action to bear on the administrative authorities. Among the members are Dr. Roux, Director of the Pasteur Institute, Dr. Landouzy, Dean of the Paris Faculty of Medicine, M. Painlevé, Minister of Instruction and of Inventions affecting National Defence, M. Brieux, author of *Les Avariés*, and other well known men. Mr. F. Jay Gould has sent a cheque for 250,000 francs (£50,000) to the Foundation Committee of the new institute.

AT the annual meeting of the Association for Promoting the Training and Supply of Midwives, held on March 14th, an address was given by Dr. E. W. Hope, M.O.H. Liverpool, on the subject of midwives and their relations with public health bodies. The comparative poverty of industrial Liverpool, he said, was reflected in the fact that out of 23,000 births last year, 17,000 were attended by midwives. He regarded it as of great importance to the community, particularly in respect to the provision of antenatal care, that the sympathies of the midwives should be enlisted officially. In Liverpool the midwives had a local association, and the authorities were thus able readily to get into touch with them, and at the same time encourage post-graduate study, of which the midwives themselves arranged the courses, given at the University. The midwives were on friendly official relationships with the Health Committee, and were regarded almost as part of the sanitary staff. Dr. Hope suggested a more careful adjustment of functions as between midwives and district nurses, and also the inclusion of four months' midwifery training in the education of the ordinary nurse.

Letters, Notes, and Answers.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C., on receipt of proof.

THE telegraphic addresses of the BRITISH MEDICAL ASSOCIATION and JOURNAL are: (1) EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2631, Gerrard. (2) FINANCIAL SECRETARY AND BUSINESS MANAGER (advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard. (3) MEDICAL SECRETARY, *Medisecra, Westrand, London;* telephone, 2634, Gerrard. The address of the Irish office of the British Medical Association is 16, South Frederick Street, Dublin.

☞ *Queries, answers, and communications relating to subjects to which special departments of the* BRITISH MEDICAL JOURNAL *are devoted will be found under their respective headings.*

LETTERS, NOTES, ETC.

NEED FOR RESIDENT SURGICAL OFFICERS AT HOSPITALS.

THE Central Medical War Committee invites applications from gentlemen of good hospital surgical experience, who, being over age or otherwise disqualified for service in the R.A.M.C., would yet be willing, if the necessity arose, to take appointments as resident surgical officers in hospitals. This appeal is not intended to interfere with the ordinary announcements of vacancies for such posts, but the Central Medical War Committee would like to have in reserve a supply of experienced surgeons who would, if necessary, be prepared to fill such appointments for a time. Applications should be sent to the Secretaries, Central Medical War Committee, 429, Strand, London, W.C.

CHEER FOR THE NERVE-SHAKEN.

DR. S. E. WHITE (London, W.) writes: In an address reported in the BRITISH MEDICAL JOURNAL of January 8th, 1916, Dr. Bedford Pierce, of York, dealing with the possible ways of aiding recovery from recent nerve disturbance or transient loss of balance, expressed the opinion that there is legal difficulty about treating these cases otherwise than by bringing them under lunacy control, and that, consequently, legislation will be necessary to do away with that section (315) of the Lunacy Act, which will not allow restraint to be exercised without the individual being certified and his case thoroughly investigated.

But is detention always required? Are there not a great many cases which, if taken early enough, would gladly go of their own accord to some home, hospital, or sanatorium for appropriate medical care and more hopeful and health-giving surroundings, were such attainable? Dr. Pierce himself points out—apparently unconscious of any inconsistency—how very successful have been the results obtained at the present time in two infirmary wards in Glasgow, and also in a branch of the Lady Chichester Hospital at Brighton. Both of these are on a voluntary footing, and carried on apart from lunacy. Sir T. Clouston's proposal for a Mental Ward in the Edinburgh Royal Infirmary was not frustrated by any legal difficulty, but only by a majority of one vote on the Infirmary Board.

That insanity is increasing is shown very clearly by the figures for the last eight years given in the BRITISH MEDICAL JOURNAL of January 15th, 1916, especially those relating to the increased frequency of first attacks. A diminished recovery-rate is also noted. The best hope for the future lies in a cheering atmosphere, such as will steady, quiet, and help the troubled mind and give it reassurance, rather than in condemning the nerve-shaken to seclusion and repression. A movement was on foot just before the war, supported by half the House of Commons, to provide such preventive hospitals under the councils. Were these hospitals in existence now, they would be a great boon for the care and cure of our soldiers invalided through nerve shock.

There are numbers of nerve-shaken soldiers among the wounded who get well in a short time in the base hospitals, thus proving that it is quite unnecessary to place the unwounded, when uncertifiable, in asylums. What they need is rest and sleep and encouragement, with ordinary medical care, interest, occupation, and recreation when convalescent. Everything that tends to remove depression and to quiet anxiety is a clear gain, and the men are very conscious of where they are and the prospect before them.

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